

▲▲▲ THE IRON AGE ▲▲▲

SEPTEMBER 12, 1935

ESTABLISHED 1855

Vol. 136, No. 11

More About Potatoes—

AMONG the many letters that were inspired by the "potato" editorial in *The Iron Age* of August 29 was one from Pittsburgh picturing the sad dilemma of a mill worker forced to become a part time farmer. It could not be answered by letter, like the rest, for Mike forgot to mention his address, and is not a subscriber to *The Iron Age*. On the chance that Mike's boss may call his attention to our suggested solution of his problem we publish his letter and our answer below:

Dear Editor:

I am worried on account of my wife going to jail and I don't have no one thousand dollars.

The reason is when the company put us on part time with nothing to do but help the boss wash the windows, they plowed up some land behind the mill and gave us each some for a garden to raise potatoes and corn.

Well Mrs. Derosky next door come over and says to my Lena can you let me have some spuds for dinner and Lena says yes, I'll trade for some sugar. Mrs. Derosky has no extra sugar and gives Lena the money for the spuds.

My Foreman sees in your paper where Congress passed a law that mill workers with gardens can't sell no spuds. Don't they know all us mill workers is now part time farmers but can't get no Government relief on account we work 84 hours per week, 24 in the mill and 60 in the garden.

Please, Mr. Editor, can you tell me how to keep my Lena out of jail on account she ain't got no shoes and them jail floors isn't so good on bare feet.

Yours truly,

Mike Kasinski.

Dear Mike:

Do not worry about Lena having cold feet in jail. Potato bootlegging is a Federal, not a State offense and our Federal penitentiaries provide all inmates with comfortable carpet slippers. Then too, by the time they get around to Lena's case there will probably be such a large waiting list of convicted potato bootleggers that the Federal jails will all be crowded. In this event, the bonus armies now being housed in Government camps throughout the South to keep them from marching on Washington may be evacuated (after election), and these resorts turned into concentration camps for potato convicts. If Lena can get along without shoes in Pittsburgh, she won't mind it in the sunny South.

But why not have Lena qualify as a full time farmer? I take it that you put in the 24 hours at the mill and she puts in most of the 60 in the garden. Let her do all of the garden work and you keep hands off. Then she will be eligible for not raising pigs or something of the sort and if she goes into the not-raising business on a big enough scale, you can quit your job at the mill and run for Congress. They could use a few good practical men there next year and God knows you couldn't make any more mistakes than the members of the last Congress did.

With best wishes to you and Lena,

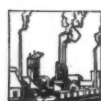
Sincerely,





Cast Iron Plate Roofing—A New

Enduring Qualities of Material Give Pronounced



INDUSTRIAL roofing is always a subject of broad and pertinent interest. The extensive field of utility, the essential requirements of good roofing and constant new demands for special plant service are all fundamental considerations in the selection of the best and most efficient material for the particular job. With the rather numerous developments in the line of roofing products in recent years there is a wide range of such materials now on the market for the attention of the prospective purchaser—some distinctly meritorious and others that have yet to demonstrate their actual value.

The latter statement is made advisedly, as, after all, time is the all-important factor that tells the story. Regardless of initial points of advantage or presumable low cost, as may be said, if the roofing material will not stand up under the wear and tear of the natural elements from day to day, and requires continual maintenance or

replacements as the years mature, there is little to commend it to the owner of a new industrial building, or, in the terms of the expanding tendency of the day, for the modernization of an existing factory structure.

The ideal industrial roof has certain definite and known factors that lend it instinctively to this particular service. These may be summed up briefly as low first cost commensurate with the life of the material; ease and economy of construction; low cost of repairs and maintenance; positive resistance to fire and the elements; resistance to destructive fumes or to other characteristics of individual plant operations tending to such ends. For a material to lay claim to all of these is one thing; to prove it by time-tried performance is quite another.

First-grade cast iron has an enviable record as an enduring material, a record that covers an almost endless variety of class and character of service. To turn this natural inherent ability to account

as a specific and adaptable roofing product presents some interesting considerations, at the same time reflecting the broadening field and possibilities of this product of the foundry. In reality, the application is not new by any means, but dates back hundreds of years. Outstanding examples testify to the value of cast iron for this purpose.

Durability Demonstrated by Time

According to C. Albert Wettengel, American Zinc, Lead & Smelting Co., St. Louis, who has given considerable time to research on this subject, the oldest existing cast iron roofing seems to be that on the famous Chinese temple at Tai Shan, a sacred mountain in that country and still a mecca for thousands of pilgrims annually. Three buildings forming this group, constructed about 500 years ago, as historical records indicate, are provided with cast iron roofs, still in service and, what is more, in excellent condition after five centuries of time. Another notable specimen of cast iron roofing is that on the



TEMPLE in China with
cast iron roof 500 years
old.

Product of the Foundry

Advantages—Wide Adaptability in Service

great dome of the national capitol at Washington, constructed of cast iron roof plates, floor plates, columns and railings. The material was cast in 1861 and installed in 1870, about 65 years ago. And in all this period of time there has been no necessity for repairs in any of the cast iron elements, or any maintenance cost whatever.

The well-known Cast Iron Building on California Street, San Francisco, has about the same record of longevity as the Capitol dome. Built in 1873 by the Hinckley Foundry Co. of that city, of cast iron units made at its plant, this structure not only has withstood most effectively the ravages of time, but was the only building to pass through the disastrous San Francisco fire of 1906 within its area, when all other structural materials suffered severely. The building is in regular use today, occupied by the American Trust Co.

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H. B. Smith at Smithville, N. J., erected in 1872 for the production of high-wheel bicycles and similar specialties, unique in those days. While the industry is now but a memory, the cast iron roofs are still there, intact and serviceable, and, what is decidedly interesting, not a cent has been expended for maintenance or repairs since the time of installation, 63 years ago, to be exact.

New Cast Iron Plate Roofing

As a recent departure in its business, the United States Pipe & Foundry Co., Burlington, N. J., leading manufacturer of cast iron pressure pipe, has designed and perfected a cast iron roofing material for industrial buildings. This iron unit and method of installation are of individual and distinctive character, with broad range of flexibility for various types of plant structures. The cast iron plates, as they may be termed, patented, are sold under the trade name of Usicast.

To make for lowest production

costs, with accordant advantages to the user, the iron plate unit with its few required accessories are standardized. The regular foundry equipment of the company is being used for manufacture. By a perfected method of blocking of the molds, it is possible to produce these cast iron plates in numerous variety, meeting all general requirements for high-grade industrial roofing.

Specifically, the Usicast plate roof is recommended for installations with roof slopes of not less than 4 in. in 12 in. The number of ridges, hips or valleys, as well as roofing vents or allied features, have no bearing, as the facility of the design and installation provides fully for any and all conditions of this kind. Thus the use has no particular set limits of roof design.

Iron Plate—Cap Plate

This new industrial roofing is composed essentially of two main units—a standard cast iron plate and cap plate. The former is a



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F-M Type QZC Enclosed Fan Cooled Motor showing end shield removed. Note fan on shaft.



Protected POWER FOR MACHINE TOOLS

F-M totally enclosed dust-proof motor provides its own two-direction ventilation—seals out metal dust and abrasives

Here's a motor that never gets into trouble because of flying metal dust and abrasives that could get into stator windings or score its shaft. It's protected power for every machine tool need. Motor efficiency stays high when the tool is new and stays high throughout its life.

Its own specially developed two-way ventilation system, including two non-clogging one-piece fans, and its cast-iron enclosing shields guarantee that the motor will not fail in the presence of dust, dirt, metallic particles, steam, moisture, abrasives or even corrosive gases or fumes in the air.

Fairbanks-Morse has built into this motor not only its traditional dependability, but

an extra margin of structural refinement and capacity to guarantee correct operation under severe service conditions. And yet it takes no more mounting room and requires no more greasing or other attention than a standard ball-bearing motor.

Before you buy or specify *any* motor for *any* purpose, see Fairbanks-Morse first. It pays. Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill. 32 branches at your service throughout the United States.

See this and other F-M Motors at our booth at the Machine Tool Show. Come in and examine the many motor models which will be shown in the various stages of construction.

Pioneer
Designers
and
Manufacturers
of



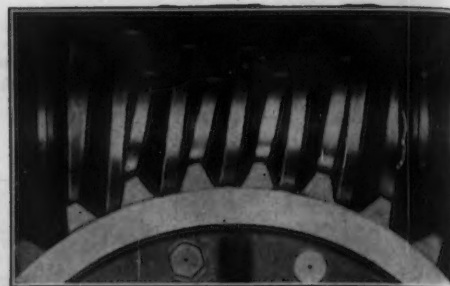
FAIRBANKS-MORSE MOTORS

POWER, PUMPING AND WEIGHING EQUIPMENT

104 Years

6469-EA40.86

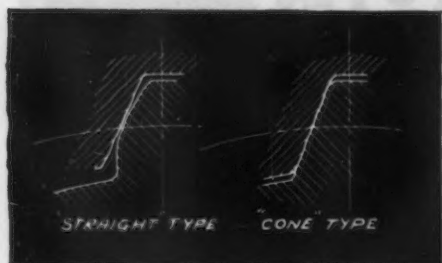
CONE AREA-CONTACT WORM GEARS NOW ON PRODUCTION BASIS



Now that complete and practical solutions of the cutting problems involved in the production of Cone Area-Contact Worm Gears have been reached, the amazing advantages of this ideal type of gear are available for wide application in industry.

The Cone Worm Gear, so named after its inventor, Samuel I. Cone, realizes in practice a principle long recognized as possessing important advantages, yet for many years impossible of production in quantity because no rational cutting method or practical tool equipment had been developed.

Continuous area contact over the



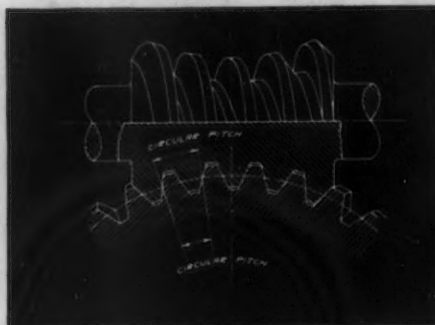
Line contact the full depth of teeth, as compared to point contact

full depth of the several meshing teeth has been achieved for the first time in the Cone Worm Gear, resulting in a long train of operating advantages.

Cone Worm Gears afford 30 times as much tooth area contact at a given time as the ordinary straight line type. The consequent distribution of pressure results in less wear, less heat generation, ideal lubrication, greater smoothness and silence, and a proved efficiency as high as 99.34%—the highest ever recorded.

Besides having the highest load-carrying capacity of any worm gear of a given size, Cone Area-Contact Worm Gearing in operation naturally provides a cushioning oil film. It wears in, instead of "wearing out," is free from pitting and operates at a lower cost per horse power transmitted than any other known worm gearing.

Furthermore, this gearing possesses a wider range of applications



Showing how area contact occurs simultaneously between worm flanks and all meshing wheel teeth

—continuous operation at 30,000 r.p.m.—intermittent operation at four revolutions per hour under extreme loads—gear ratios as high as 100 to 1 and as low as 1 to 1—are examples of standard conditions under which Cone Worm Gearing is operating.

The whole secret of the success of the Cone Area-Contact Worm Gear lies in the practicability of the method and the means by which it is manufactured: Automatic generation of both worm and wheel blanks without cutting away stock essential to the finished tooth form.

Production



Corner of Michigan Tool Company plant showing several types of Cone Area-Contact Worm Gears in production

WITH the solution of the apparently simple, but exceedingly intricate production riddle represented by Cone Area-Contact Worm Gearing, cutting tools and machines for both large and small scale production covering the complete range of sizes, gear ratios and capacities have been developed. This machinery is available for manufacturers who choose to set up their

own production and is also installed as standard equipment for manufacture of gears by the Michigan Tool Company to supply customers' requirements.

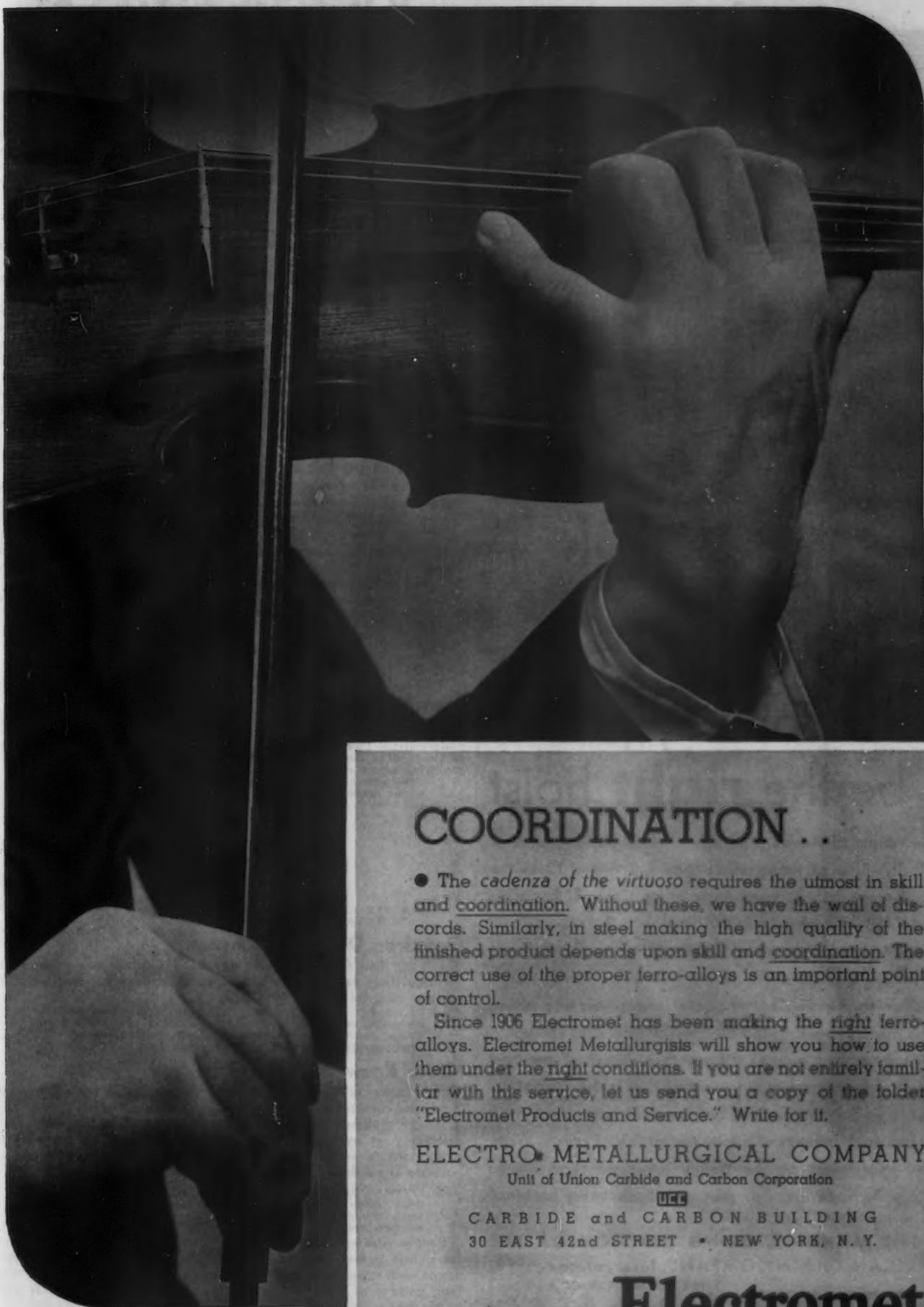
Complete information covering technical data on Cone Area-Contact Worm Gears, as well as details relating to production, operation and applicability, will be gladly supplied in response to inquiry.

MICHIGAN TOOL COMPANY
DETROIT, MICHIGAN

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COORDINATION...

● The *cadenza of the virtuoso* requires the utmost in skill and coordination. Without these, we have the wail of discords. Similarly, in steel making the high quality of the finished product depends upon skill and coordination. The correct use of the proper ferro-alloys is an important point of control.

Since 1906 Electromet has been making the right ferro-alloys. Electromet Metallurgists will show you how to use them under the right conditions. If you are not entirely familiar with this service, let us send you a copy of the folder "Electromet Products and Service." Write for it.

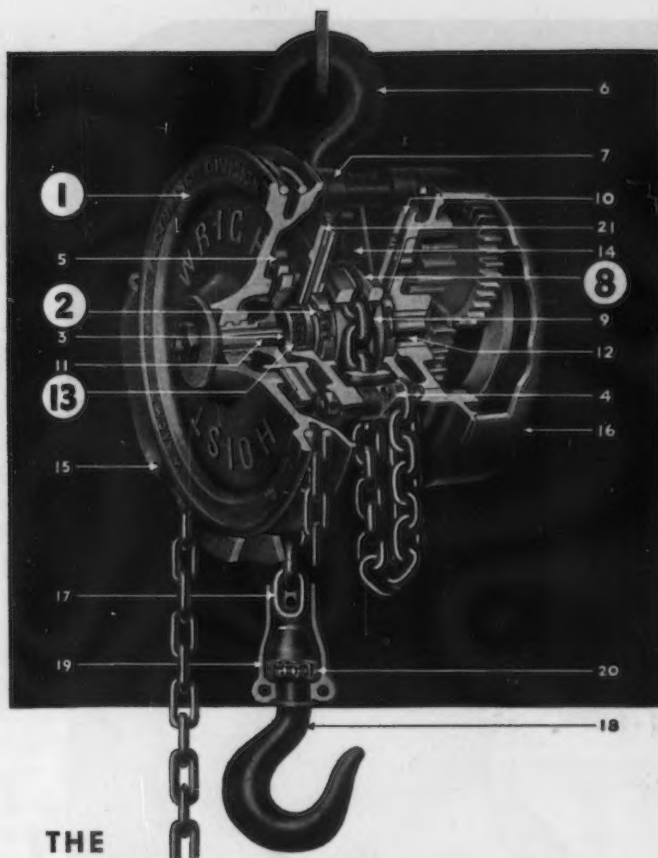
ELECTRO-METALLURGICAL COMPANY

Unit of Union Carbide and Carbon Corporation

UCC

CARBIDE and CARBON BUILDING
30 EAST 42nd STREET • NEW YORK, N. Y.

Electromet
Ferro-Alloys & Metals



THE Wright Hoist proves itself—point by point— to be the **right** hoist

● The Wright Improved High Speed Hoist has 21 points of superiority. Four of these points (Nos. 1, 2, 8 and 13 in the above illustration) will particularly impress you. 1. The zinc-coated finish—found only on Wright Hoists. 2. Precision ball bearings—positively grease-sealed with ground inner and outer races. 8. Load-chain safety guard—which prevents load chain from riding out of pocket, regardless of position of hoist. 13. Ball-bearing spindle—which increases efficiency, reduces wear and assures alignment at point of greatest speed. The four features alone assure that in the Wright Improved High Speed Hoist you get the *right* hoist. And you'll be just as much impressed by the rest of the 21 points. Write for full information on the Wright Improved High Speed Hoist and its application to your specific hoisting problem.

WRIGHT MANUFACTURING DIVISION OF THE
AMERICAN CHAIN COMPANY, Incorporated
YORK, PENNSYLVANIA

In Business for
Your Safety

WRIGHT

Improved High Speed Hoists

JUST BETWEEN US TWO

They Think It's Wonderful

VERY likely Mr. Heinz believes that the mouth that bites into another brand of pickle belongs to a head that should be examined. Mr. Chrysler must shake his head in wonderment over those who choose other than a Dodge, Chrysler or Plymouth. The same goes for Mr. Squibb and his toothpaste and so on.

While pride in product is natural and admirable, it does not make for exact calibration of the sense of values. You would not think, for example, of asking Mr. Marx, of Hart Schaffner & Marx, to list the first five makes of men's ready-made clothing in order of quality. You would suspect that Mr. Marx' personal interest would influence his judgment.

Pride in product is as rife in the trade paper field as elsewhere. Breathes there a publisher with soul so dead that he does not believe readers would wither and die without his paper? That is why you are perfectly right in salting generously any publisher's opinion of the importance of his paper to its readers.

And that is why we never tire of shouting from the housetops that independent investigations of reader-interest usually find The Iron Age standing in lonely eminence in the column headed, "Publications found most useful."

Cashes In on Bible

EVEN in the tolerant, superlative-hating Oberleutnant we detect signs of the overwhelming pride in product that must obsess Messrs. Heinz, Chrysler, Squibb and so on.

To him it seems inconceivable that anyone in the industry can continue to metabolize without reading The Iron Age. When confronted with evidence that this feat, while difficult, is not impossible, he bares his teeth and mutters, "How can such things be!"

For example, here is a New Jersey tool manufacturer who writes:

"I do not have time to read any papers except the Bible; therefore, you can remove our name from your list."

"The Lord gave His promise 'My people shall prosper' and we are simple enough to believe in His promises and are cashing in without having the wisdom of this world."

They Found the Key

ALTHOUGH the "transporting troops" problem (p. 91, Aug. 22 IA) was too much for the office mathematical genius, "Just-Between-Us-Two-ers" found it child's-play. A typical solution is that submitted by M. H. Collins of Samuel M. Langston Co., manufacturers of paper working machinery, Camden, N. J.:

"Tell your mathematical wizard to find the least common multiple of the figures from 1 to 10. When he gets this number, deduct one from it."

1 2 3 4 5 6 7 8 9 10

2) 6 7 8 9 10

2) 3 7 4 9 5

3) 3 7 2 9 5

1 7 2 3 5

$2 \times 2 \times 3 \times 1 \times 7 \times 2 \times 3 \times 5 = 2520 - 1 = 2519$ men
to be transported across the stream."

Gumdrop Dipped in Vinegar

THE pig and feed man is in again. He thinks our puzzles are ridiculously easy, and, what is worse, proves it. But he takes out the sting by adding graciously:

"I do like The Iron Age. The editorials and articles on economics and economic problems are very good. They contain much sound, conservative sense that other sources of information often lack."

Never Knew We Had One

THE "make-up" of a trade paper is like your stomach. When you are not conscious of it it is functioning satisfactorily.

Stodgy make-up tires your eyes. Bizarre typographical effects distract your eyes and interfere with the main purpose of the paper, which is to convey useful information as painlessly as possible from the printed page into your cerebrum.

A Western paper manufacturer writes:

"We have a customer who is very much impressed with the general make-up of The Iron Age. We are particularly anxious to secure information, etc. . . ."

People who specialize in the arrangement of type and pictures frequently praise the make-up of The Iron Age. So rather than argue with experts we will admit that Frank Winters, who converts long galleys of type and stacks of cuts into neat pages, is good at his job.

Rest Your Feet

OUR booth at the Machine Tool Exposition, Cleveland, is A-1. Drop in when you feel you need a rest. If the chairs are all taken by members of the staff, announce yourself as a cash customer by giving the Fascist salute and a chair will be vacated for you immediately.—A.H.D.

THE IRON AGE

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Sales Offices

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Contents—September 12, 1935

More About Potatoes	9
Cast Iron Plate Roofing.....	10
Cutting Tools Keep Pace with Progress.....	15
Polish Intensifies Sales Appeal.....	20
Welding Speeds Up Pipe Line Construction.....	24
Joining Handles to Pan Bodies.....	27
Late Returns from Laboratory and Mill.....	28
New Equipment	30
News	35
Personals and Obituaries	37
Washington News	38
Automotive Industry	42
Rate of Activity in Capital Goods.....	46
Statistics on Metal-Working Activity.....	48
Markets	49
Construction and Equipment Buying.....	68
Products Advertised	92
Index to Advertisers	116

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Quality
that counts
in
GALVANIZED
SHEETS**

EVERY quality that counts in ease of fabrication or makes for satisfactory service is present, and in good measure, in Bethlehem Galvanized Sheets. They are soft and ductile; tightly and evenly galvanized with prime western spelter; accurately sheared and of uniform gauge.



BETH-CU-LOY Sheets afford this same combination of desirable qualities, plus the inherent resistance to rust of their copper-bearing composition.



BETHLEHEM STEEL COMPANY

GENERAL OFFICES: BETHLEHEM, PA.

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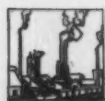
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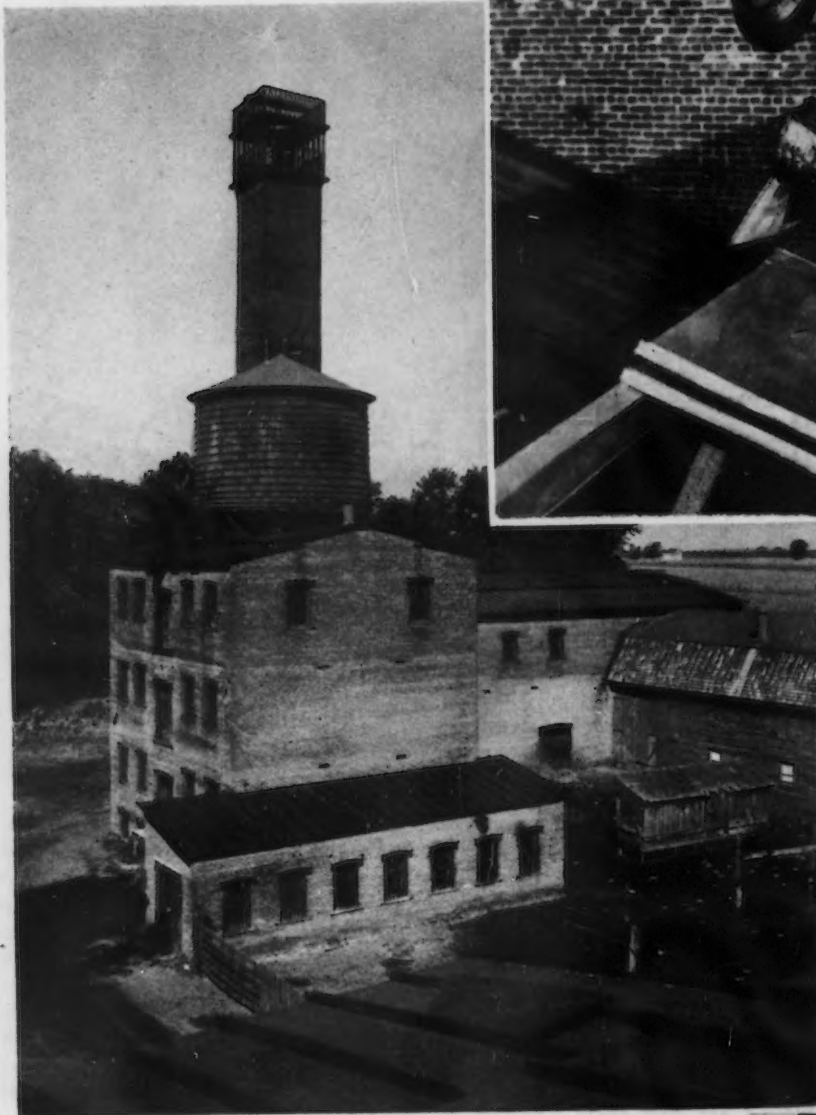
costs, with accordant advantages to the user, the iron plate unit with its few required accessories are standardized. The regular foundry equipment of the company is being used for manufacture. By a perfected method of blocking of the molds, it is possible to produce these cast iron plates in numerous variety, meeting all general requirements for high-grade industrial roofing.

Specifically, the Usicast plate roof is recommended for installations with roof slopes of not less than 4 in. in 12 in. The number of ridges, hips or valleys, as well as roofing vents or allied features, have no bearing, as the facility of the design and installation provides fully for any and all conditions of this kind. Thus the use has no particular set limits of roof design.

Iron Plate—Cap Plate

This new industrial roofing is composed essentially of two main units—a standard cast iron plate and cap plate. The former is a

○ ○ ○
 AT RIGHT
 LAYING cast iron ridge roll
 plate.



○ ○ ○
 ABOVE
 EXTERIOR, Smithville, N. J., plant,
 cast iron roof.

○ ○ ○
 AT RIGHT
 CAST iron dome, Capitol Building,
 Washington.



single casting of 3/16-in. thickness, 52 in. long and 24 in. wide. In installation, this plate rests on the roof purlins and forms the bulk of roof area exposed to the elements. Each plate unit weighs only 78 lb., with a factor of safety to support a distributed load of 4000 lb., on 4-ft. centers—more than 12 times the requirements of general building codes. Installed, the weight averages less than 11 lb. per sq. ft., or well within the specifications of approved modern construction.

are used in this construction, comprising modified sections of the standard roof plate described. These consist of a half-width roof plate, used for completing alternate courses or staggered courses of the roof; and a short roof plate of identical design, employed where purlin spans are less than 4 ft.

The cast iron cap plate is semi-cylindrical in shape, of the same length as the roof plate, as will be readily understood. It is provided with a lug, which has a slotted hole

two standard types; and ridge roll plates for roofs of sawtooth design.

How Roof Plates Are Assembled

The roof construction, or method of assembling the cast iron plate units, is simple, effective and economical, requiring but brief explanation. All work is handled from the top and no scaffolding of any kind is necessary. The iron plates are laid in courses, with overlap of 4 in. between, the joints being staggered. Between each

LAYING cast iron roof plates.



The cast iron plate is provided with flanges along the longitudinal sides to prevent joint leakage and, at the same time, impart strength to the casting. The hood, likewise adding stability to the cast iron unit, has been designed to cover the cap plate with snug fit in the lower course. On the upper side of the roof plate there are two lugs, one at each corner, as will be noted in illustration; these engage with the upper roof purlin and facilitate installation. Should these lugs be damaged during the laying of a roof, the construction of the cap plate is such as to prevent any sliding of the iron roof plate from the purlin.

Intermediate cast iron members

for the locking device fastening the member to the upper purlin flange. This lug is near the lower end of the cap plate; in installation, it projects down between the sides of the adjoining standard iron plates and under the purlin flange noted. Lips at each end of the cap plate are for the purpose of securely engaging the flanges of the standard roof plate.

Only a few accessories are required for this new type of cast iron roofing. These include a simple locking device for purlins with flanges down the slope or up the slope, respectively; a cast iron end finisher, used when no end wall exists; ventilator curb castings of

plate on each course, a space of about 1 in. is allowed, the cylindrical cap plate being fastened over this gap, using the lug on the member for this purpose, as previously noted. The accompanying illustrations indicate clearly the simplicity of the construction.

This cast iron roofing plate can be installed readily by unskilled labor. A foreman and a small crew of, say, three men can lay about 3000 sq. ft. of surface in an average working day. Thus the construction cost is reduced to a minimum.

The flexibility of a roof of this type makes for numerous features of advantage to the owner. For instance, if at any time after such a roof is laid it is desired to install a



TYPICAL installation, cast iron roof plates, fastening to purlins

vent or a stack, the cutting of the necessary opening or openings in the plates is a very simple matter, using an oxy-acetylene torch or drilling a series of small holes with a portable drill. The stack or vent flashing can be quickly and readily bronzed or electric-welded to the iron plates. Again, a monitor may be erected or a factory building increased in height with equal facility in the change, and likewise any other required building alteration.

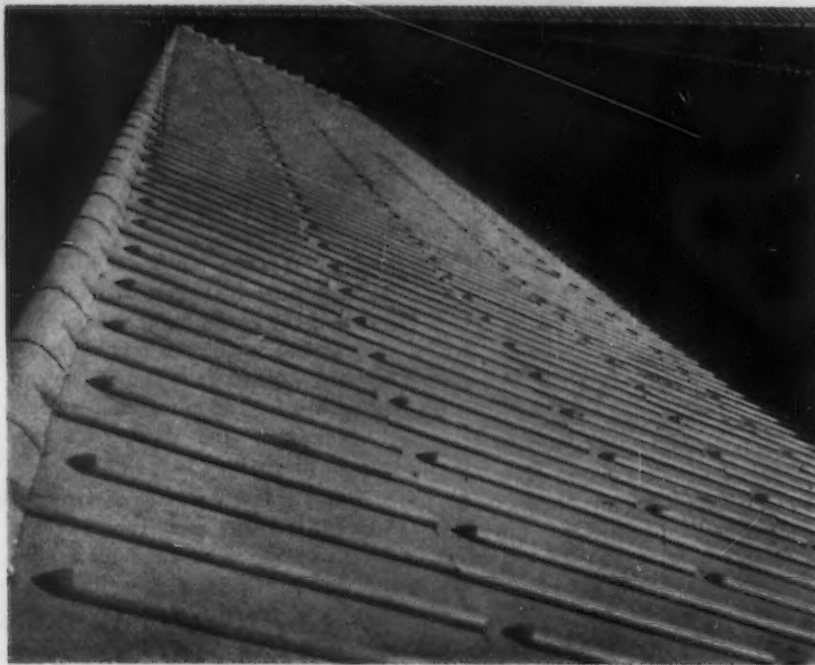
Further, there is the salvage value. Capable of use for an indefinite period of time, the cast iron roof plate can be removed from one building and easily utilized on another structure, where plant conditions change and new buildings give way to old. In the event of entire plant destruction or discard, the cast iron roof has a definite salvage value as scrap material.

First Commercial Cast Iron Roofing

This is the first cast iron roof to be manufactured and sold on a commercial basis. The company

points out that Usicast roofing has all the inherent merits of quality cast iron as a basic material. Painting, even with a single shop

this page give a comprehensive idea of the simplicity and ease of construction of the standardized design in actual plant service.



TYPICAL cast iron roof—Otis Elevator Co., Harrison, N. J.

coat, is optional, this treatment having no particular effect on the life of the roof and being for appearance only. The initial cost is the only cost; there is no expense of upkeep or maintenance of any kind, with complete assurance of life and utility for a period of time that cannot be estimated.

A number of interesting installations have been made, including, among others, a large roof area at the plant of the Otis Elevator Co., Harrison, N. J., and on the annealing building of the Bessemer, Ala., plant of the United States Pipe & Foundry Co.

The illustrations at the top and bottom of

Metal Cutting Tools Keep Pace With Machine Tool Progress

By A. H. d'Arcambal

*Consulting Metallurgist, Pratt &
Whitney Co., Hartford, Conn.*



THE hardening room in the majority of tool manufacturing plants some 15 or 20 years ago was considered the secret chamber of the plant, visitors being conducted through this department only on rare occasions. Considering the general unsatisfactory appearance of the hardening rooms of that period, most of which were provided with shuttered windows to prevent the good old daylight from peeping through, equipped with inefficient fuel-fired furnaces having little or no temperature control, belching flame and smoke, it was a good plan perhaps not to admit visitors to this secret, unclean chamber.

What a change has taken place during this short period of years! The hardening room of a modern small tool manufacturing plant today is what might be called the show place of the entire plant, and well may it be so. Shutters have been removed from the windows, walls cleaned and painted, modern fuel-fired or electric furnaces with automatic temperature controls and electric timers installed. Carbon and high-speed steel electric semi-muffle-type furnaces have controlled atmosphere—an important factor for proper tool hardening. Quenching tanks with fixtures of improved design are in constant service. All pyrometers are checked daily against master

thermocouples and instruments to assure accurate temperatures for the hardening and tempering operations. It is axiomatic that "a tool is no better than its hardening treatment." The expense in-

HARDENING of metal cutting tools and advances in inspection gages, which have benefited "metallurgically" along with cutting tools, are discussed principally in this, the concluding, part of Mr. d'Arcambal's interesting article, continued from THE IRON AGE of Sept. 5, page 60. Nitriding and chromium plating of tools, to increase wear resistance, are also taken up briefly. It is pointed out that inasmuch as economical production of modern cutting tools requires special machines, fixtures, gages, etc., and the best of hardening, testing and other equipment, as well as study of new designs and of the possibilities of new steels and their proper heat treatment, the making of such tools is definitely the work of specialists.

curred in equipping hardening rooms with the very best of furnace equipment, maintaining these rooms as a model for neatness to inspire better work, has proved to be an investment paying large dividends. Better quality tools with low scrap loss—real economy. A modern all-electric hardening room is shown in Fig. 21.

Hardening Carbon Steel Tools

Tools made of carbon steel, such as taps, dies, drills and reamers, are usually heated in a salt bath furnace or preferably a lead bath at temperatures ranging from 1440-1480 deg. F., muffle-type furnaces being employed only on rare occasions. These bath furnaces are equipped with automatic temperature control whether fuel-fired or electrically heated, the majority of tools being hardened on a time-temperature basis. These carbon-steel tools are quenched in a fairly strong brine solution maintained at a temperature of 65 to 70 deg. through proper refrigeration, special quenching fixtures being used for certain types of tools.

It is just as important to properly temper or draw carbon-steel tools after the hardening operation as it is to use care in the hardening treatment. Many firms employ modern air-drawing furnaces with fans for the tempering operation, others preferring oil or low-temperature salt baths, tem-



peratures employed ranging from 250 to 550 deg. F.

Hardening High-Speed Steel Tools

The majority of cutting tool manufacturers are using semi-muffle-type furnaces for hardening their high-speed steel tools, furnaces of the electric globar type becoming more and more popular. High-speed steel tools are usually preheated at a temperature of 1500 to 1600 deg. F., then placed in the high temperature chamber at a temperature ranging from 2300 to 2400 deg. F., depending upon the type of tool and analysis of the steel employed. Cobalt high-speed steels and the high vanadium, molybdenum high-speed steels men-

tioned previously in this article require a hardening heat in the neighborhood of 2400 deg. F.

In the case of fuel-fired furnaces the tools should not be allowed to soak at the hardening temperature, as coarsening of the grain will occur, with resultant brittleness. Where electric globar high-speed steel furnaces are employed, the tools may be soaked for a short period after reaching furnace temperature without any effect on grain size. It is the usual practice to quench high-speed steel tools in an oil bath, saws being quenched under a press to prevent warping. Some manufacturers prefer to cool certain types of tools in air, but an objection to air quenching is the greater formation of scale.

Practically all high-speed steel tools today receive the high drawing treatment, that is, drawn at temperatures varying from 1050 to 1200 deg. F., depending upon type of tool and service conditions. Tools drawn to 1050 deg. F., for example, if made from high-speed steel of correct composition and quenched from the proper temperature, possess the same hardness as tools in the undrawn condition, together with twice the toughness. It is difficult, moreover, to grind high-speed steel tools not properly drawn without the formation of grinding cracks; sufficient reasons for high drawing all high-speed steel tools. One still finds in his travels a hardener of the old school who refuses to draw high-speed steel tools after the hardening operation. Fortunately these cases are becoming less in number as time goes by.

Microscope Examination Important

All cutting tools should be carefully checked for hardness. The Rockwell hardness tester is considered the standard instrument today for checking the hardness of cutting tools and gages. The file test is used in connection with the Rockwell test, all files being carefully selected and tested before being placed in service. The hardness reading on a tool is not a true indication of its cutting qualities but merely serves as a guide. Metallurgists connected with tool



FIG. 24—Electrolimit gage employed for grading cylinder bores.

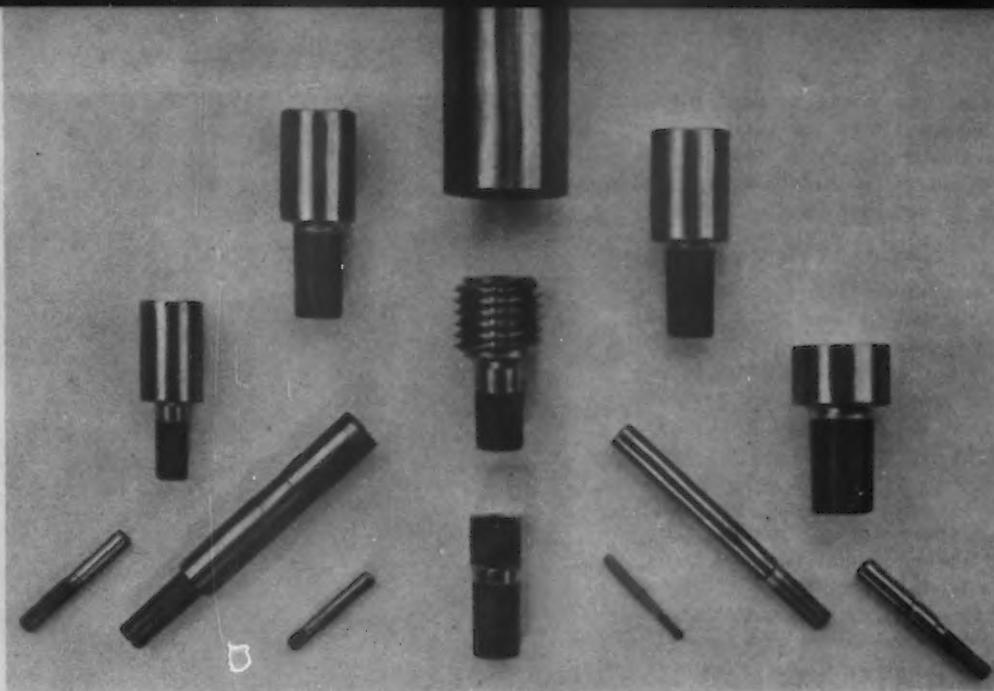
AT LEFT

FIG. 21 — Modern all-electric hardening room. Expense of equipping hardening departments with best of furnaces and of maintaining them as a model of neatness has inspired better work and has proved to be a paying investment.

o o o

AT RIGHT

FIG. 23—Group of worn out tool-steel gages salvaged by chromium plating and refinishing.



manufacturing plants are daily making liberal use of the microscope, studying the structure of tools given various treatments, as well as keeping a careful record of cutting results so as to develop the proper structure along with the correct hardness. All steels used by the company with which the writer is connected are purchased under definite specifications calling for the correct chemical composition, Brinell hardness, microstructure, hot acid etch test, fracture test, etc. In the examination of incoming shipments our metallurgical department records

over a period of years show a large tonnage of steel rejected for improper microstructure. Years of experience have demonstrated that tool steels must have the proper microstructure as received in the annealed condition from the mill, or tools made from these steels even though properly hardened will not give maximum results. One can see, therefore, that the microscope is a very important tool of the metallurgical laboratory.

Nitriding of Tools

One hears much regarding nitrided high-speed steel cutting

tools. The author's company has been experimenting with nitrided tools for more than 10 years, and during that period we have learned that there is a very limited field for nitrided taps, reamers, cutters, hobs, etc. The very hard nitrided surfaces unfortunately are quite brittle, regardless of the nitriding treatment used. For this reason extreme care should be used in determining the proper type of tools to be nitrided, a great deal depending upon the design of the tool and the material being machined, as well as general operating conditions. We do have records of

o o o

AT RIGHT

FIG. 22—Chromium plating department for plating directly on metal to provide increased wear resistance.

o o o



several jobs where nitrided high-speed steel tools are giving considerably more service than similar tools not nitrided, but there is a very limited field for this product.

Chromium Plating

The advisability of chromium plating cutting tools for increased wear resistance is often questioned. As in the case of the nitrided product, chromium-plated tools possess a fairly high degree of brittleness due to the absorption of occluded hydrogen during the plating operation. We have not been entirely successful in chromium plating taps or similar threaded tools because in the majority of cases the tools chip or break after short service or else do not give superior life to unplated tools. Reamers properly chromium-plated, when used on non-ferrous materials and in some cases cast iron, do give considerably longer life than reamers not plated. Several manufacturers machining large quantities of aluminum alloys and similar non-ferrous metals are using

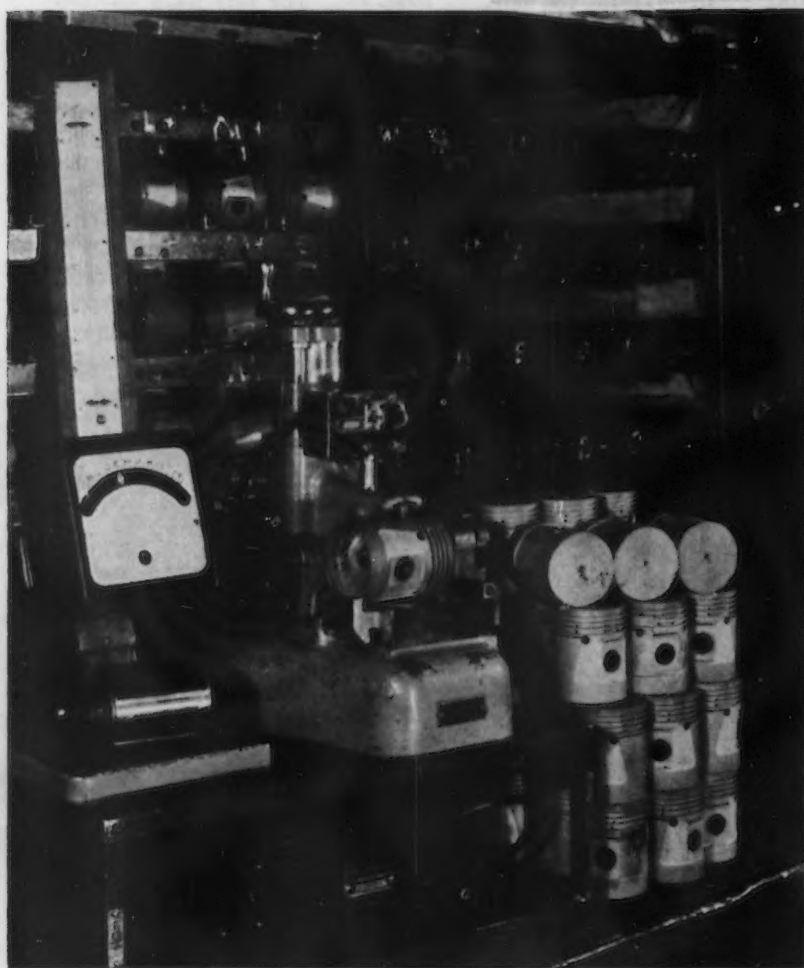


FIG. 25—Electric gage set-up for grading pistons.

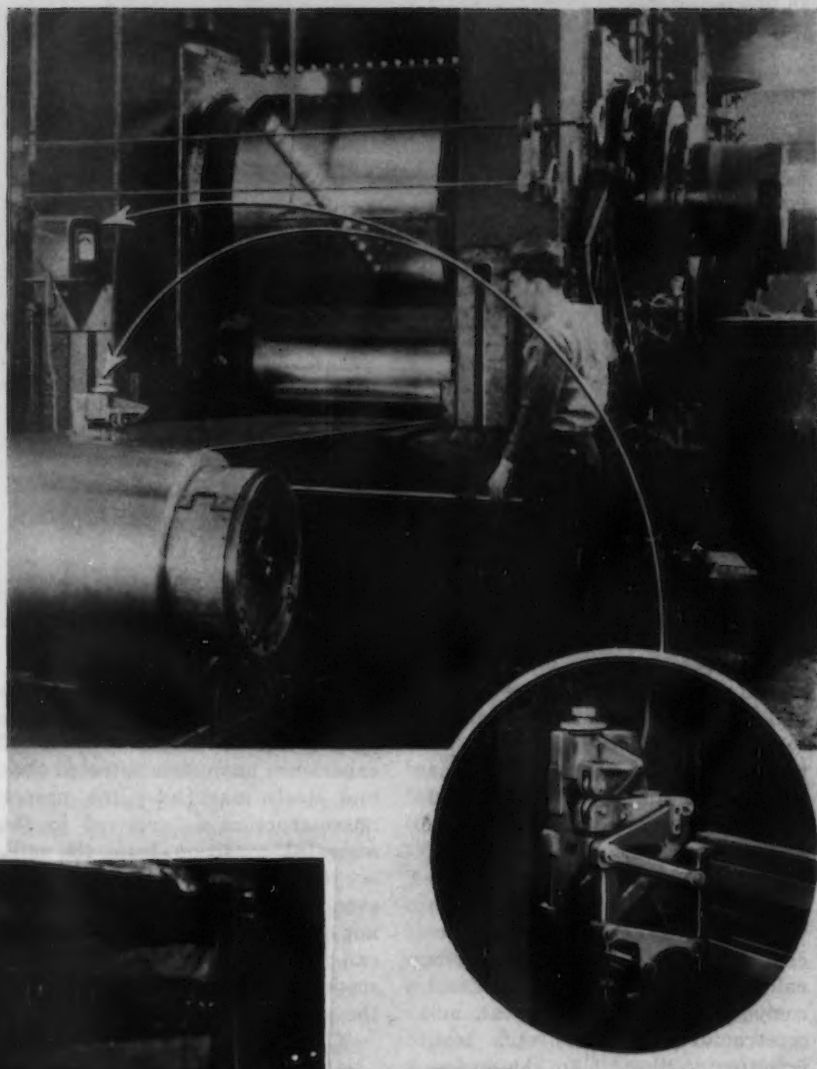


FIG. 27—Strip mill equipped with Electrolimit gage for continuously inspecting the thickness of the metal as it leaves the mill. Thickness variations are immediately indicated in terms of ten thousandths of an inch. The insert shows a close-up of the gaging mechanism.

chromium-plated carbon and high-speed steel reamers with marked economy and tool cost.

There is some demand for high-speed steel screw slotters with the sides given a flash plate of chromium. These saws, especially when used on cast iron, give increased service over saws not plated because the fine cast iron dust does not build up on the sides of the chromium-plated saw as occasionally happens with the unplated product.

As our knowledge of chromium plating increases, undoubtedly we will find increased application for chromium-plated cutting tools. Fig. 22 shows a chromium-plating de-

partment for plating directly on metal for wear resistance.

Tool Making Best Done by Specialists

Manufacture of modern cutting tools is a precision job best carried on by specialists. Machines especially designed for economically performing the many operations in the manufacture of metal-cutting tools must be employed. Special fixtures, gages, etc., are used for the proper making and checking of the product. The very best of modern hardening room equipment must be available. A well-equipped and properly operated metallurgical department for controlling two of the three important factors covering the life of metal-cutting tools, namely, steel and hardening treatment, insures tools being made of the best quality steel, properly treated. A special department for testing tools made of different designs and from steels of various types and treatments, results in the improvement of the product from time to time. A large number of concerns formerly making most of their cutting tools in their own tool rooms are now purchasing their tools from specialists at a marked saving in their tool costs. Manufacturers of small tools yearly are introducing tools of improved design, using the best of steels available with the proper hardening treatment. The progressive manufacturer realizes that progress cannot be made through marking time, even though he may believe his product to be of a satisfactory quality.

GAGES

NO discussion of the development in cutting tools during the past 10 years would be complete without mention of the development in the principles of gaging and in the design of the gages themselves. Many of the advances

in metallurgy which have benefitted the cutting tool industry have also been of great assistance in the development of better gages.

The World War brought re-emphasis of the advantages and the need for manufacture on a strictly interchangeable basis. Tolerances of 1914-1918 were quite liberal as compared with those of the present day. During the years following the war, the principles of interchangeable manufacture were applied to and developed in many lines to a higher degree of perfection. Engineering research

did not measure up, as the tolerances permissible under the old system of promiscuous interchangeability were closer than practical with available equipment. The development of the use of electricity in gaging solved both the inspection and manufacturing problems. With electrical gages, designed especially for each inspection, the cylinders and pistons are accurately and rapidly graded so that conditions essential for the efficient performance of the assembled motor are assured. So, too, are the wristpins, the small end

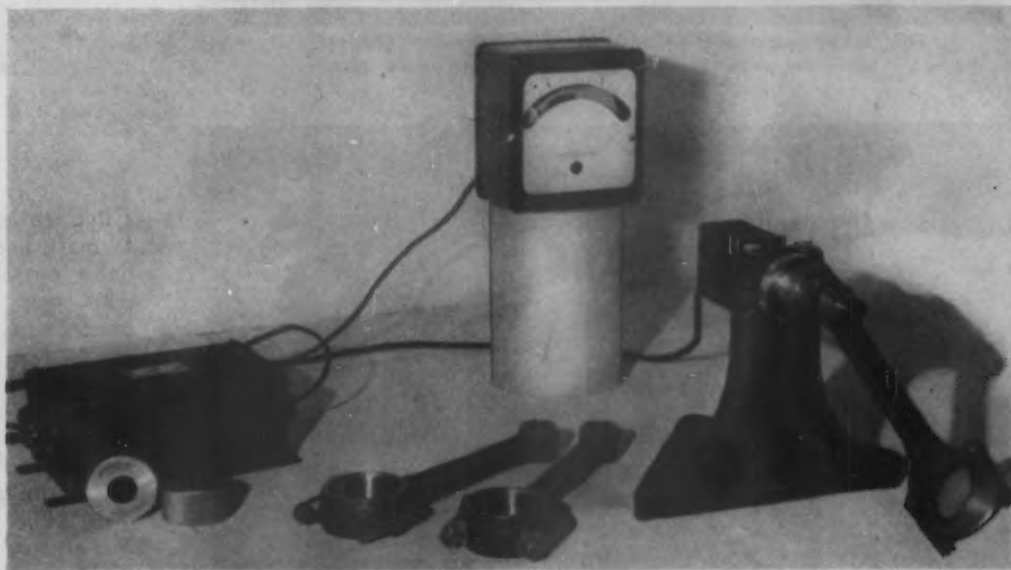


FIG. 26—Grading of wristpin holes in connecting rod.

kept pace with manufacturing development, and in the last few years has set a pace which the manufacturing departments have found difficult to follow. Typical is the experience in the automotive industry.

Efficient performance at all speeds with a minimum amount of noise and with maximum life is demanded of cars in all price classes. It is a tribute to engineering development and manufacturing skill that these are accomplished facts. Exhaustive research with metals, lubricating oils, designs and clearances, disclosed the ideal conditions at each vital point of the automotive engine—cylinder and piston; wristpin, connecting rod and piston; main bearing and connecting rod. Only the very slightest variation from these ideal conditions can be permitted without a marked lowering of the performance standard. Manufacturing and inspection methods available

of the connecting rod, and the hole in the piston graded; and we have the modern automotive engine—quiet, long-lived and efficient.

Modern metallurgy has done much for the gages and the gage user. First came the development of alloy steels, then chromium plate and finally the various tungsten and tantalum carbides. All are widely used today in the manufacture of gages and permit the gagemaker or gage user a wide range of materials from which to select to get the highest performance—the lowest cost per piece gaged.

Figs. 23-27 illustrate the use of modern materials and designs to meet common inspection problems. Fig. 23 is a group of conventional gages, originally made of tool steel, which have been worn out but are now again ready for service after having been salvaged by chromium

(CONTINUED ON PAGE 74)

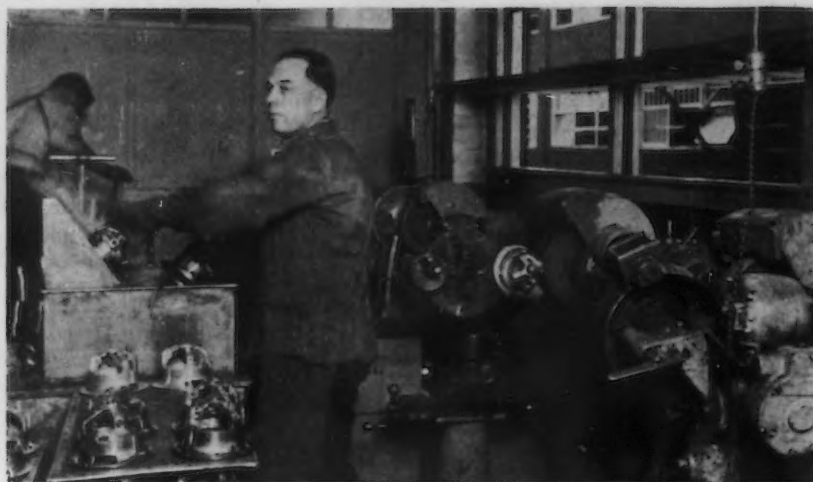


FIG. 1—Semi-automatic polishing of cylindrical motor housings.

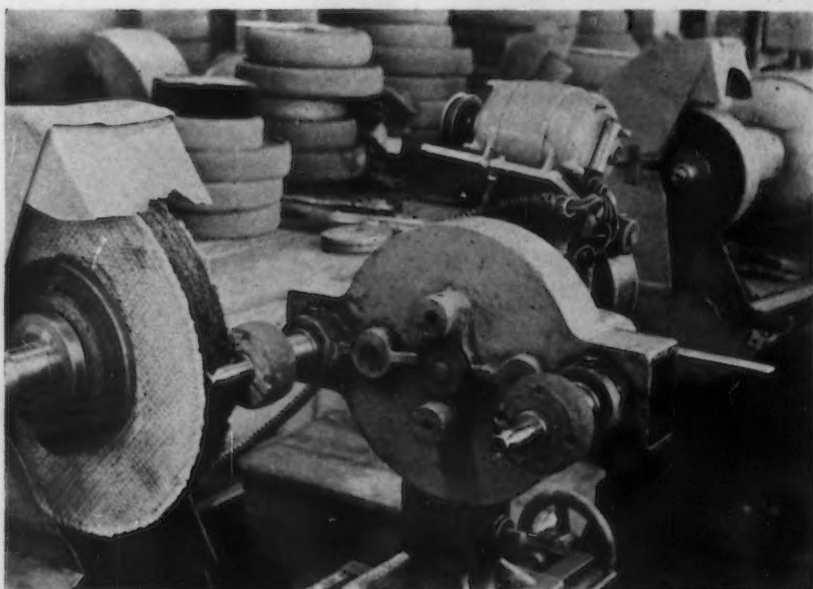


FIG. 2—Automatic polishing applied to fan pulleys.



FIG. 3—Polishing parts on a vertical belt.

Polish Intensifies Sale Of Hoover Products

FINE feathers do not always make fine birds. But fine finish on a good product does help, measurably, in merchandising it. In this article, Mr. Jacobs tells how the Hoover Co. of Canton, Ohio, puts the polish on its attractive line of household electric appliances. The specific data given concerning grits, wheel sizes, etc., make this article particularly useful.

• • •



AMONG the numerous electrical household appliances developed during the last quarter century to lighten the burden of the housewife, the electric vacuum cleaner ranks high. Indeed, once used such an appliance is indispensable. A cleaner without an attractive exterior, its parts left rough just as they come from the foundry and forge, will function properly and from a mechanical point of view it is perfect. However, such an article would not "sell." That is one reason why these articles are finished highly. Another reason is that any reputable manufacturer takes enough pride in his product to finish it pleasingly regardless of whether this would influence sales. The entire product of the Hoover Co., Canton, Ohio, is electric vacuum cleaners which are very highly finished and in this article are il-

s Sales Appeal r Products

By FRED B. JACOBS

illustrated and described a few of the more important polishing room operations.

In ordinary polishing room practice a diversity of comparatively flat parts can be polished rapidly and satisfactorily by hand. This is due to the fact that the operator does not have to change the position of his hands during the operation. Comparatively thick pieces can be held by hand readily. In finishing thin pieces simple holding fixtures are provided.

In finishing various cylindrical parts, however, the problem is more difficult. With this class of work the operator must constantly relocate the work, turning it in his hands, until the entire surface has been gone over. This difficulty some years ago led to the development of semiautomatic polishing and buffing machines for cylindrical work and many such machines are used at the Hoover plant. A good example of semiautomatic polishing is given in Fig. 1. Here the work consists of finishing the outer diameter of motor housings made of die cast aluminum alloy. An Acme automatic polishing machine is used in conjunction with an ordinary polishing lathe. The operator loads the work on the spindle shown at the right, which in the present instance is empty. Then he turns the polishing head one-half revolution so that the work is brought in contact with the wheel. In this position the work makes several revolutions while in contact with the wheel. As the work turns



FIG. 4—Six station, turn-table sleeve polishing machine.



FIG. 5—Disk grinding often saves time in finishing.



FIG. 6—Hand polishing requires good lighting.

at an even speed, and as the pressure on the wheel is constant, evenly finished work is the result. While one part is in process of polishing, the operator washes a previous part in grease solvent in a tank provided conveniently for the purpose, and then loads the empty spindle. Thus the operation is practically continuous. In comparing this procedure with that necessary if the operator held the work by hand it is obvious that a substantial time saving results.

The wheels used on this machine are stitched muslin, 16 in. in diameter, 2 in. face with the surface formed at a slight radius to take care of the shape of the part which can be seen from the parts in the left foreground of Fig. 1. The wheel is operated at a speed of 1800 revolutions per minute. This gives an approximate surface speed of 7500 feet per minute which is normal for an operation of this kind.

The parts in question are finished by a four-wheel operation. The first wheel is set up with No. 120 manufactured alumina, worked dry. The next wheel is No. 200 material. This wheel is greased. The next two operations are buffing and coloring on muslin wheels. They are buffed with tripoli and colored with rouge. The number of polishing machines used on this operation varies with the work. For example, two double head lathes fitted with Acme polishing machines would take care of the entire operation, two men being required to run the four machines. With work a little slack, however, one man and one machine could look after the production. In this case he would put a specified number of parts over the first wheel and then set up for the next operation and so on.

Another good example of automatic polishing on small work is shown in the close-up view in Fig. 2. This is an Acme polishing machine of the same type as previously shown. In this instance the work consists of buffing steel fan pulleys. This part is $\frac{3}{4}$ in. in diameter and 1½ in. long with a V belt groove. The wheel is a bias muslin buff 16 in. in diameter, 2 in. face, operated at 1800 revolutions per minute giving a surface speed of 7500 feet per minute. The cylindrical parts shown just back of the work are hand grips to enable the operator to hold the work spindle while he screws the work on in place, the pulleys being provided with a



FIG. 7—A special department for setting up polishing wheels.

tapped hole at one end. This also serves as a good example of how the design of the piece can be taken advantage of in locating it for a given operation.

The life of any polishing wheel between settings is of course determined by its circumference, for the larger the wheel the longer it will cut without setting up. Thus it is readily apparent why belt polishing was introduced many years ago. Thus a belt 10 feet long has a cutting surface equal to that of a polishing wheel approximately 40 in. in diameter.

The first belt polishing machines were crude affairs consisting simply of a canvas belt set up with abrasive run over two pulleys, one the driver, the other the idler. The belt ran over a work rest to afford pressure in applying the work. Improved belt polishing machines as shown in Fig. 3 work on a more efficient principle. They are made vertical to save space and are provided with a feed roller against which the cylindrical work rests as it passes the belt. The roller is set at a slight angle so that its rotating action pulls the work past the belt. Such a machine, a Production belt polishing machine, is shown in Fig. 3. The work in this instance consists of finishing aluminum alloy cylindrical agitators 11.8 in. long and 2 in. in diameter. They are put over belts 10 ft. long and 6 in. wide, Nos. 100, 120 and 180 aloxite. These ready made belts take the place of the canvas belts formerly used as mentioned previously. To afford the necessary backing to the work, the abrasive belt runs over and with a special

composition rubber belt which in turn passes over machine pulleys.

Another excellent example of the automatic buffing of cylindrical work is shown in Fig. 4. This work consists of buffing brass sleeves used for locating various cleaning tools with which the Hoover cleaners are provided. These sleeves are 1½ in. in diameter and 2½ in. long. The machine carries six wheels 14 in. in diameter, 2 in. face. The wheels are operated at a speed of 1750 revolutions per minute which imparts a surface speed of approximately 6500 ft. per minute. Tripoli is used on the first three wheels, white compound on the last three. The first four wheels are stitched, the last three are loose.

The machine is fitted with a turntable carrying six work locating spindles which are set at an angle as Fig. 4 shows. The buffing wheels also are set at an angle and each one is provided with an individual motor drive. The operator unloads the work as the spindle before him stops and then loads this spindle. The turntable then makes 1/6 revolution to bring the work over the first wheel where it makes three revolutions in approximately six seconds. Then the table turns another sixth revolution and so on until the parts have been brought in contact with all the wheels. Finally the sleeves are subjected to a coloring operation by hand on 14-in. muslin wheels on which white compound is used. The parts then are ready for plating with nickel, followed by chrome. The machine in question is a special unit designed and constructed by the Hoover Co. engineers.



FIG. 8—After polishing, parts go through a washing machine.

While it is true that disk grinding is often a cross between a grinding and a polishing operation, disk grinding of many parts is carried out in the Hoover Co. polishing room. Such an operation is shown in Fig. 5 where the work consists of finishing a flat surface on the back of a main frame of a little cleaner technically termed a Dustette. It is a little cleaner used for dusting, as its name implies.

Referring to Fig. 5, the work is held in a special fixture so that it locates from its base. It is clamped in place by the lever shown. Then by rocking the work table back and forth by hand and applying pressure by the operator's right hand, the back surface of the part is finished smooth and square. This machine is a Besly disk grinder fitted with an abrasive disk 36 in. in diameter, 30 grit. A number of other flat parts are finished in this manner and in many instances operation is more rapid than milling.

While it is true that automatic polishing and buffing solves many production problems, not all parts can be handled in this manner. A large majority of parts are of irregular shape and such parts must be put over wheels by hand. In Fig. 6 is shown a battery of 28 double spindle polishing lathes which is only one part of the polishing and buffing department. While daylight is taken advantage of, the department is liberally equipped with mercury lights, for satisfactory polishing and buffing cannot be done in a dark place.

The wheels used in this department are canvas, muslin and felt ranging from 10 to 16 in. in di-

ameter, while the lathes operate at 1750 revolutions per minute, being electrically driven. As the illustrations show, the men sit at their work where this position is found to be more convenient than standing. On some work, polishing and buffing comparatively large pieces such as large cleaner castings, more efficient results are derived by working in a standing position. In general, steel parts are put over wheels set up with 120, 180, 200 and 220 material. These wheels are stitched muslin. Buffing follows on muslin wheels with white compound. Aluminum alloy parts are put over wheels set up with Nos. 80, 120, 200 and 240 material. The first three wheels are muslin stitched, the last wheel felt. These parts are then buffed with rouge and colored with white compound on muslin wheels. Both manufactured alumina and Turkish emery are used, 200 and finer being emery.

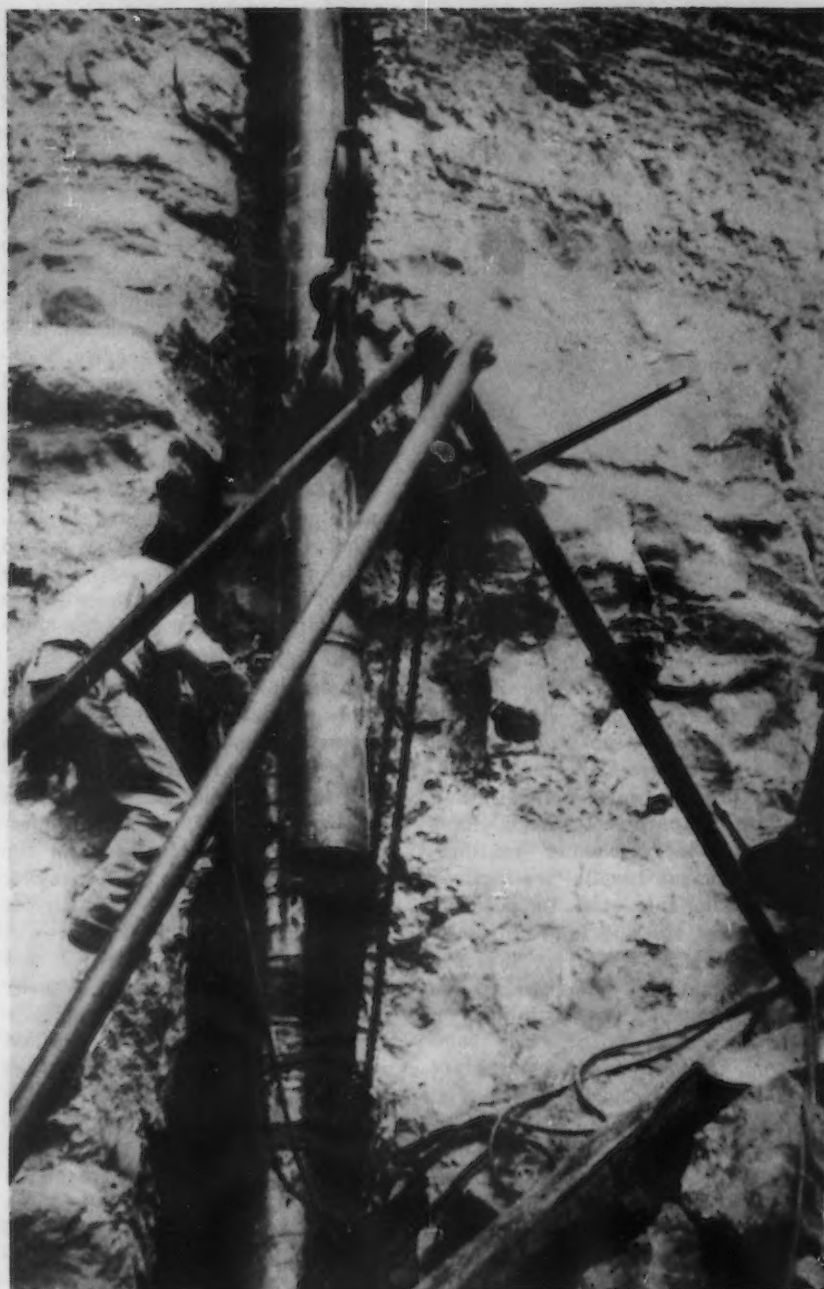
With a production of millions of polished parts annually, it is evident that a large stock of polishing wheels must be kept on hand at all times. Approximately 1000 separate wheels are necessary. With such a large number of wheels on hand it is necessary that they be set up at frequent intervals, long enough in advance so that they can dry for at least 24 hours before being put to use. The wheel setting-up department is shown in Fig. 7. A good grade of hide glue is used which is cooled in steam cookers. Only a small amount is prepared at a time for glue that is old or that has been kept under heat for any length of time loses its strength.

Thus if such glue was used for setting up wheels the abrasive would not hold in place properly. The abrasive is kept in covered containers and the wheels are coated with glue and rolled in the abrasive according to the generally accepted practice.

Under ordinary conditions one or two coats of glue and abrasive are all that is necessary, but if the wheel head has been broken it is of course necessary to remove it entirely. In this operation the old head is cut away with a grinding wheel dresser after which the surface is trued carefully with a buff stick. Then several successive coats of glue and abrasive are applied. This is a long process. Thus a good polisher never wears out an entire wheel head, but turns the wheel in for setting up as soon as the outer coating is worn away.

As stated previously aluminum alloy parts are buffed with rouge. After this operation the parts are put through a Hobart washing machine, the loading end of which is shown in Fig. 8. The parts in question are cleaner frames and the type of rack used for conveying them is shown at the left. In the cleaning machine the parts are put on an endless woven wire belt and passed successively under a spray of grease solvent, then under a spray of soda and water and last under hot water. As the castings emerge from the other end of the machine they are of course hot. Here an operator brush coats them with a white buffing compound mixed with water. The water dries out almost instantly leaving the compound in place. Then they are color buffed on muslin wheels.

In the manufacture of the Hoover Co. product there are a large number of comparatively small parts such as rings, clips, etc., that are too small to be held conveniently by hand. Such parts are finished by water polishing in DeVilbiss tumbling barrels. These barrels are filled about two-thirds full of parts and 4-F manufactured alumina and water. Two hours' tumbling is sufficient to impart a satisfactory polish. Then the parts are washed carefully to remove abrasive and subjected to a ball burnishing operation in tumbling barrels. Parts subjected to water polishing only are sufficiently smooth to take cadmium plating, while ball burnished parts can be nickel and chrome plated.



PIPE line buried in sandstone cliff, 65 deg. from horizontal, showing cutting of pipe to make a vertical weld.



THE engineering advancement made in welded steel pipe line installations in recent years is demonstrated forcibly in a lately completed project of this character in California. Within a period of 72 days, a little over two months, a 10-in. pipe line has been built for a distance of 89 miles through a rough and mountainous country, stretching from the Kern County oil field district to a terminus at Torrance, near Los Angeles.

Such a record-breaking accom-

plishment is one of no mean order when it is considered that only a few weeks need be added to the period of time noted for date of actual inception of the program—contracting with Eastern mills for the required steel pipe, water transportation of the sections to the Pacific Coast, and thence haulage to construction site, miles distant. This achievement of today stands out in sharp contrast with a similar project of the same company about 23 years ago, when it required the larger part of a year to install an 8-in. steel pipe line from

the Midway oil fields in California to Los Angeles harbor, approximately 150 miles.

The 1935 development not only shows the progress made in installation methods, but reflects the improvements in fabrication of material, welding operations, transportation facilities, pipe handling on the job and other mechanical and engineering factors entering into such construction. Incidentally, the new pipe line is said to be the highest steel pipe line in the world, reaching an altitude of 4200 ft. at points along the route, making the installation problems involved all the more difficult.

This project has many features of decided interest. The line was designed and built by the General Pipeline Co., Los Angeles, a wholly-owned subsidiary of the General Petroleum Corp. of California, both identified with the Socony-Vacuum Co., and represents a gross investment of more than \$1,000,000. It brings to the refineries of the parent company at Torrance a stream of crude oil totaling 50,000 bbl. or 2,100,000 gal. per day; to move this same volume by rail would require about 200 tank cars, making a train close to two miles in length.

Pipe Sections Joined by Electric Welding

Actual construction of the pipe line was started on April 11, this year; it was ready for service on June 21, exactly 72 days later, as mentioned. With the expenditure for the project authorized, the pipe was ordered from three mills on March 4, these being the National Tube Co., Youngstown Sheet &

Speeds Up Line Pipe Construction

Eighty-Nine Mile Oil Line Is Built in 72 Days

Tube Co., and Spang-Chalfant Co., respectively, the allotment being divided into 4100 tons, 3200 tons and 800 tons among these producers, in order noted. The shipments were specified to arrive by water route at Los Angeles harbor during April.

The pipe used was Grade B seamless line steel pipe, the larger portion weighing 34 lb. per ft., with 0.307-in. wall thickness, tested to 950 lb. The sections were arranged in 40-ft. lengths. Approximately 15 miles of the line is of heavier pipe, with rating of 40 lb. per ft., 0.365-in. wall thickness, tested to 1200 lb. This latter was laid at points where the shock of the pumps would be the most severe, as well as in regions where the static pressure would be greatest. The pipe was belled at each end to receive a chill ring and was connected throughout by electric welding. To indicate the extent of the project in unit figures, 469,920 lin. ft. of pipe was required, with gross weight of over 18,000,000 lb.

In the interval of time between the ordering of pipe and its arrival, the land department of the company was active in securing necessary rights-of-way and proceeding with surveys for the exact route. For speeding the construction, the program was arranged in three main divisions, on which work was carried out simultaneously—a northern division of 34 miles; central division of 33 miles; and a southern division of 22 miles. The line traverses the rough country of the Tehachapi Mountain range in the State, across deep canyons, up precipitous cliffs, through the Sepulveda Tunnel, near the Soldiers'



VIEW of line in Tehachapi Mountains. At this point the right-of-way runs near the Ridge Route highway.



MAKING a bend in 10-in. steel pipe line. One caterpillar holds the pipe, while another draws the end with a cable attached to side-boom.

Home at Sawtelle, and for many miles of farm lands and city streets, where soil and drainage conditions were encountered in numerous variety. Most of the rugged country was encountered on the northern and central divisions; the difficulties of mountain construction, however, were more than balanced on the southern division by the trials of city work.

Speaking of the situation leading up to the installation of the new pipe line, E. L. Adams, vice-president and general manager of the company, points out that the matter of sufficient crude oil supply was a problem of immediate concern. The original 8-in. line, built in 1911-12, referred to, was about the largest used for such transportation at the time of construction. It had become congested, however, with the increased demand for oil, despite the fact that the capacity had been augmented by means of loops in the 8-in. links between pumping stations at Emidio and Lebec, and the pumping facilities increased at these plants. It was necessary to make arrangements with other companies to transport required oil at their convenience by tanker from coast loading points, and at a price much greater than the normal pumping cost for pipe line service.

The new 10-in. line reaches from the pumping station at Lebec southward to the oil refinery at Torrance, the major portion following the same general route as the former 8-in. installation. The new construction utilizes a portion

of the existing 8-in. line as a loop to the system, and employs part of the remainder of this smaller pipe to make complete lines of heretofore existing loops between Emidio and Lebec—in other words, a double lining between these points, and salvaging as much as possible of the remaining 8-in. pipe for future use.

The capacities of the pumping stations at Lebec, Emidio, Reno and Grapevine were increased with the addition of new auxiliary electric-operated centrifugal pumping units and accessories, made by the Pacific Pump Works, Los Angeles. The new installation provides an increased output of about 10,000 bbl. per day. The first noted plant, Lebec, is connected with a large network of gathering pipe lines, collecting oil from hundreds of wells in the rich producing centers for main line transmission, including the Kettleman Hills, Midway, Kern, Mountain View, Maricopa and neighboring fields.

Material-Handling Equipment Speeds Operations

Trenching machines equipped with revolving buckets were employed for excavating the pipe trenches, while truck cranes and 60-hp. tractors provided with side-booms were used to elevate, hold and place the steel pipe in position in the trenches. Back-filling of trenches was accomplished by means of tractors, which operated with marked facility over rough and hazardous areas. Following a soil survey, it was decided to pro-

tect about 30 miles of the southern portion of the line from possible corrosion. This section of the pipe was treated and wrapped by the Consolidated Steel Co., Los Angeles, according to approved specifications, the field-treating of the welded joints being handled by the general contractors.

As soon as the new 10-in. line was completed from Lebec to the next station on the route, Liebre, it was placed in commission, and the former 8-in. line between these points taken up for use in completing the double-lining between Emidio and Lebec pumping stations, previously referred to. Prior to placing the different sections of the new welded pipe line in service, scraper equipment, commonly known as a "go-devil," was sent through the entire lengths to clean out the trash that invariably finds its way into a line during construction, despite all precautions. Water was pumped into the line to propel the "go-devil," and this same water used to give the pipe line, section by section, a hydrostatic test in excess of 100 lb. per sq. in. above the pressure to which subjected in actual operation.

The hauling and stringing of the pipe were handled by the transportation department of the company. Construction of the line was carried out jointly by the Lang Transportation Co., and Marco-Robertson, Ltd., both of Los Angeles, while field work in laying of pipe was under the direction of J. L. Martin, general superintendent of the pipeline company. Contract for

the electric welding was let to H. C. Price, Inc., Bartlesville, Okla. About 400 men were employed on the project during construction.

Welding Puts Screw Pipe in the Discard

Discussing the highly successful attainments in the construction of the new steel pipe line, Mr. Adams, referred to, says:

"New methods and equipment for laying pipe are not entirely responsible for the increased speed and efficiency evidenced in connection with this project. New and excellent highways in the vicinity of the route facilitate transportation enormously. On the old pipe line job, camps for the workmen had to be established and a large part of the necessary transportation was for supplies for these camps, and horse-and-wagon movement of men to and from the job.

"On the former 8-in. pipe installation, material in approximately 20-ft. lengths had to be hauled from the nearest railroad point, sometimes 40 miles away, to the job site for stringing, and largely in wagons drawn by long teams of 16 to 18 mules. Trucks hauled some of the pipe, it is true, but at that time they were a lot of grief. Today, the trucks and trailers are loaded at ship-side or railroad siding, with pipe of approximately 40-ft. lengths, and move directly and quickly to the job, the pipe often being strung from the truck.

"Formerly in the rough and mountainous country, the pipe had to be snaked-in, a joint at a time, using mules over a difficult and jagged trail. Now a caterpillar tractor, equipped with a blade, 'bulldozes' a road over the pipe line right of way, and side-boom caterpillars place the pipe exactly where it belongs.

"The old 8-in. line was of screw pipe and required large tong gangs; it is true that for the particular installation referred to, a pipe-screwing machine was used for a good part of the laying, in some ways, perhaps, an improvement over the hand method. The advent and perfection of welding, however, first oxy-acetylene, and later electric, have put screw pipe into the discard so far as trunk lines are concerned. In present day work of joining a line, the welder and his helper work silently and intently. Contrasted with the bois-

terous tong gang of the old days, they give the impression of a scientist and his assistant performing an experiment."

In developing this project, the company considered an alternate plan, comprising the construction of a steel pipe line directly west from the Kettleman field to the coast, with tankage and loading facilities at a proposed station there. From this point the oil would be transported to Los Angeles harbor by tankers, and re-pumped from such place to the refinery at Torrance. The proposal for the new 10-in. line direct from Lebec proved the more feasible

plan, however, not only making for greater ultimate economy, but lending itself at the same time to easier and simpler further expansion beyond the immediate capacity required. Moreover, it also served to eliminate three main-line pumping stations previously located at Liebre, Newhall and Maynard.

This notable pipe line achievement, accomplished in record-breaking time, was carried out without mishap of any kind. The installation represents one of the most effective crude oil trunk line developments in the country—thoroughly modern, well built, well protected and of large capacity.

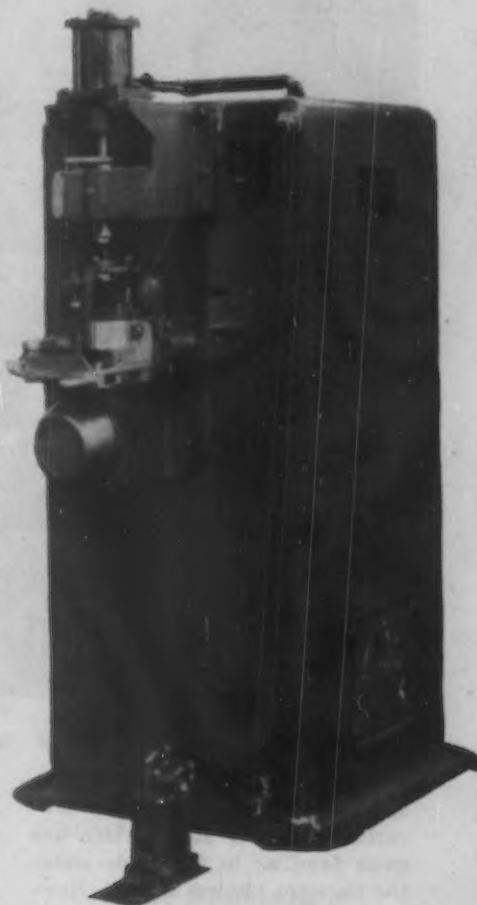
Handles Tightly Joined to Pan Bodies By New Percussion Welder

SUBSTANTIAL lowering of cost with a much-desired improvement in quality in the production of pans, rice boilers, roasters and other similar enamelware is attributed to the percussion welder here illustrated, which was developed by the Federal Machine & Welder Co., Warren, Ohio. Accurate control of current through an electronic tube device is a basic feature of this new machine.

In addition to speeding up production, the machine is said to overcome a troublesome difficulty commonly experienced in welding of the handle to the body or lid of enameled utensils. Due to incomplete joining, the overlapping pieces of metal have a tendency to retain a certain amount of acid or alkali, which is introduced initially into this opening during the pickling or washing that precedes enamel dipping and baking operations. The acid or oxide thus retained generates a gas during the baking operation, producing in the finished pan an objectionable fine black line or bubble where the two pieces of metal come together.

By the percussion welding process the handles are butt welded directly to the side of the pans or other receptacles. Thyatron or ignitron panels, devices recently developed for accurate control of current, permit use of one-half cycle, a full cycle or any number of cycles, to suit requirements; and equipped with this device the current may be closely controlled to assure complete union of two adjoining pieces of metal. With this complete union of handle and pan body, without extrusion or excess

metal around the welded parts, all acid or alkali is entirely excluded. The final result is that the enam-



PERCUSSION welder, recently developed, for joining handles to pan bodies. It is shown with a saucepan and handle in the dies, ready for the welding operation.



HANDLES are rapidly welded on these and other types of pans by the Federal percussion welder. Current is accurately controlled by an electronic tube device.

eled pans come from the enameling ovens with no marks, bubbles, or black lines.

As to production, it is stated that one operator can weld two handles onto dishpans at the rate of 300

articles an hour; and in thus making 600 welds an hour, the percussion process is faster by more than five times than the gas welding method previously employed for the same work. In another installa-

tion, 480 handles are being welded hourly to the side of saucepans.

The machine illustrated is rated at 75 kva. It is shown with a saucepan and handle in the dies, ready for the welding operation.

Late Returns from Laboratory and Mill

SELENIUM seems destined for increasing use as a free-machining agent, as it is more potent than sulphur and does not produce slag-like stringers.

Zig-zag welding method protects stainless steel from impairment as a result of heat generated by electrical resistance process.

Iron and steel products are coated with metallic boron crystals by a Coast company and a Milwaukee firm is producing an I.J.D. alloy which shows high service life in acids.

Steel crystals have fibrous texture according to new concept. Striped steel strip is developed for "modern" installations.

Selenium for Free Machining

SULPHUR has been used extensively for many years in low-carbon non-alloy steels which are quite familiar to the trade under the name of "screw stock." However, sulphur combines with certain metals in the steel (usually manganese) to form non-metallic sulphides which occur in the form of slag-like stringers in rolled or

drawn bars. In high-sulphur steel the extent of this non-metallic matter is often sufficient to discourage its use in high-grade alloy steels which must undergo heat treatment and later be subjected to severe service.

For some time it has been contended that selenium is a better free-machining element than sulphur. The use of selenium has already been partly established in 18-8 nickel stainless steel, wherein it imparts very satisfactory free-

machining qualities. And greater use in all types of iron and steel seems assured, as Carpenter Steel Co. has been assigned patents covering selenium additions to the S.A.E. steels as well as to plain and alloy tool steels.

A given percentage of selenium does not produce as much slag-like material as does an equal percentage of sulphur; therefore a cleaner and more uniform steel is obtained. Selenium is also more potent than sulphur; so a smaller percentage

By T. W. LIPPERT

The Iron Age, New York

suffices to impart a certain free-machining effect. Likewise selenium steel responds readily to heat treatment.

Selenium is considerably more expensive than sulphur; therefore the price of steel to which selenium has been added is higher. Also, the selenium steels are made in an electric furnace, which is conducive to higher quality rather than lower costs. Thus the applications of these new alloys will probably be selective for some time, and limited mainly to parts where the machining costs are relatively much greater than the cost of steel involved.

Mechanical Zig-Zag Welding

WHEN stainless steel sheets are welded together by the electrical resistance method, the qualities of the metal are usually im-

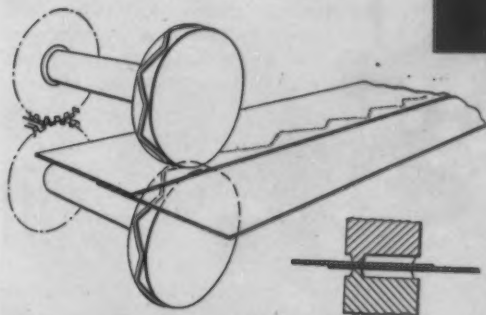


FIG. 1—Mechanical zig-zag welding to join metal more securely. The schematic diagram demonstrates the mode of operation, and a cross-section of the embossed electrodes is shown at the lower right.

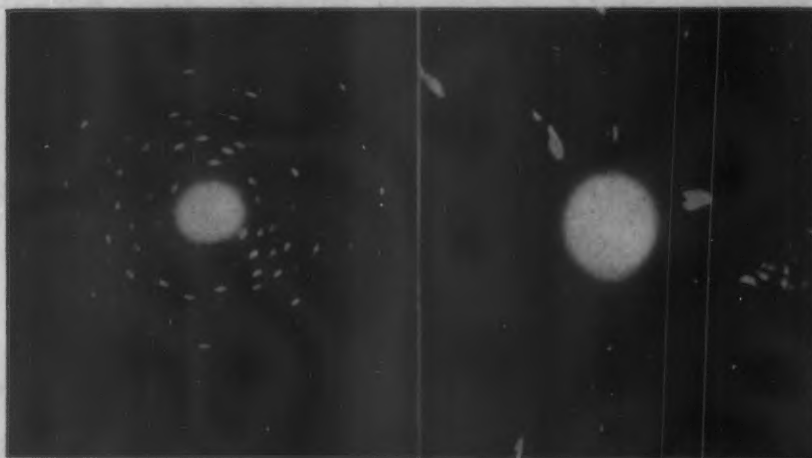
paired by the annealing effect produced by the heating. To decrease this weakening effect, the E. G. Budd Mfg. Co., Philadelphia, has developed and patented the embossed geared electrode device shown in Fig. 1. The zig-zag path taken by the electrode materially increases the length of the weld, thus minimizing local reduction in strength.

Boron Used as a Surface Finish

METALLIC boron crystals are now being used to protect metallic surfaces against the ravages of wear and corrosion. Colmony, Inc., Los Nietos, Cal., has developed two processes to apply these very hard crystals to steel and iron products, namely, the "sweat-on" and the "cast-on" methods.

A "sweat-on" is performed by mixing metallic boron crystals with silicate (water glass) to form a stiff paste. The surface to be processed is then covered with this paste to a thickness normally 1/16 to 1/8 in. An oxy-acetylene blow-pipe, carbon arc or atomic hydrogen torch is used to sink the crystals into the parent metal. A relatively

polished surface is desired. The metallic boron crystals are held in a matrix of nickel alloy, which has a lower melting point than steel (about 2000 deg. F.), facilitating easy melting and pouring to fill any desired space between a copper or cast iron mold and the metal to be processed. A 100 per cent bond results, the boron surface having a

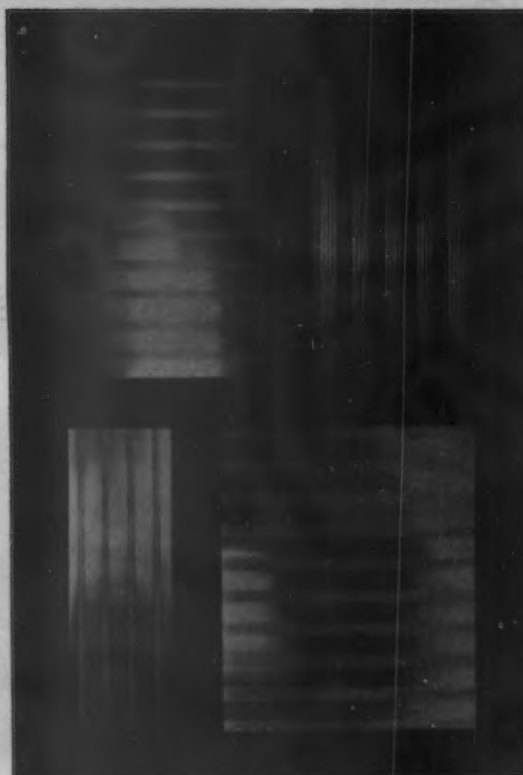


ABOVE
FIG. 2—A new interpretation of "radial asterism" has been advanced by N. P. Goss, of Cold Metal Process Co. So-called crystals of Armco iron, which should show the familiar single-crystal pattern like that above, have been found to show the pattern on the right. This latter pattern is interpreted as indicating a fibrous structure.

o o o

AT RIGHT

FIG. 3—Several types of strip steel now marketed by Acme Steel Co. The stripes and patterns are rolled into the steel by specially ground rolls.



smooth surface results, although the diamond-hard, non-oxidizing, corrosion-resistant crystals retain their identity and do not fuse into a solid mass. After such processing, the parent metal is free to expand or contract, formed or forged without disturbing the wear-resistant, corrosion-resistant overlay.

The "cast-on" process is used where a very smooth or ground and

hardness of about 601 Brinell. Such a surface has remarkable resistance to abrasion and also is not readily attacked by alkalis or acids.

Alloy Resists Acid

A PROMINENT manufacturer of street lighting equipment uses a 10 per cent solution, 18 Be. acid,

(CONTINUED ON PAGE 67)



Improvements in Production

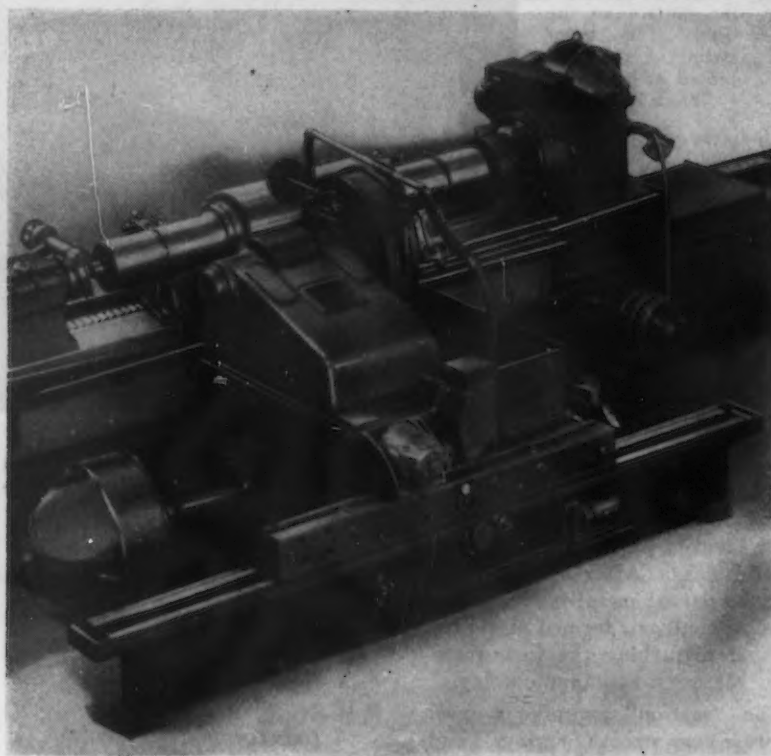
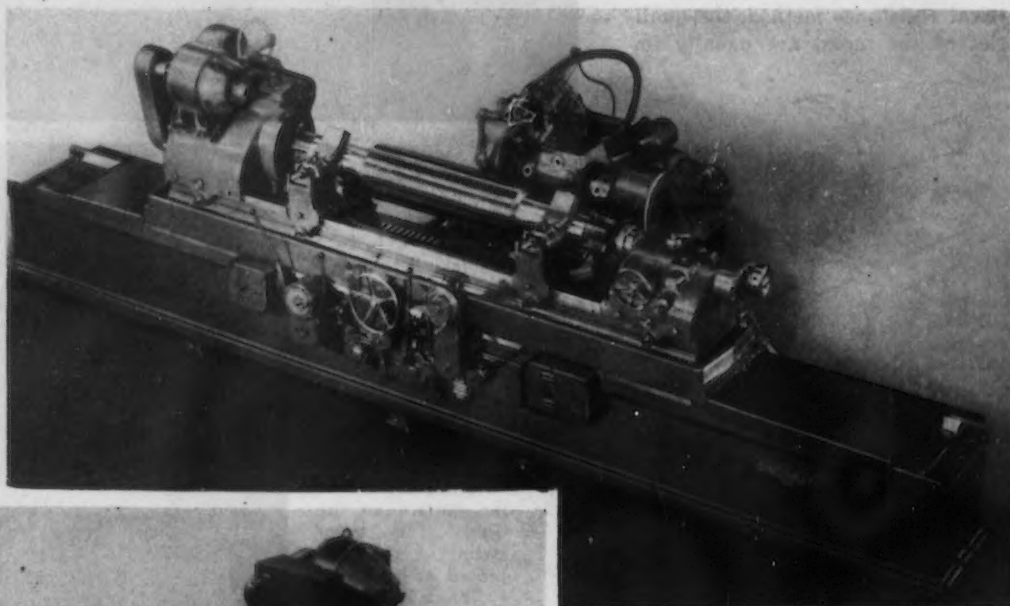
Improved Precision Roll Grinding Machines

IMPROVEMENTS incorporated in the Cincinnati roll grinding machine, built by Cincinnati Milling Machine and Cincinnati Grinders, Inc., Cincinnati, provide for more simple operation and at the same time serve to better the accuracy and the quality of finish. Sizes are: 20, 24 and 28 in. swing, with

distances between centers up to 192 in. Utility range is from that of roughing chilled alloy iron rolls to the most sensitive of finish and limit requirements. Wheel truing is independent of any other unit. A hydraulic cylinder, located behind the wheel guard, supplies the power for traversing the diamond.

The design of the truing device is similar to that employed on the company's centerless grinders. Either straight or slight-crown truing is attained. A single directional control lever determines the travel of the truing tool across the wheel, while the setting of a knurled knob determines the rate

THE flexibility of cambering equipments permits of a large variety of concaves, convexes, crowns or curvatures on rolls subjected to grinding treatment on these improved roll-grinding machines.



of traverse. Closer accuracy and higher finish are attributed to a new "radial type" spindle bearing which requires only infrequent adjustment. It is not necessary to readjust when changing from even the heaviest roughing cut to the lightest finishing grind.

Efficiency, finish and low maintenance cost are featured by design of pressure feed lubrication to work and table ways, power cross feed to wheel head, and low angle table with thrust support rack.

All electrical control buttons are in two boxes at the operator's position in front of the machine and all control levers are compactly grouped for fast operation.

Bar-type and cam-type cambering mechanisms are available. The flexibility of the bar type is said

and Shop Equipment . . .

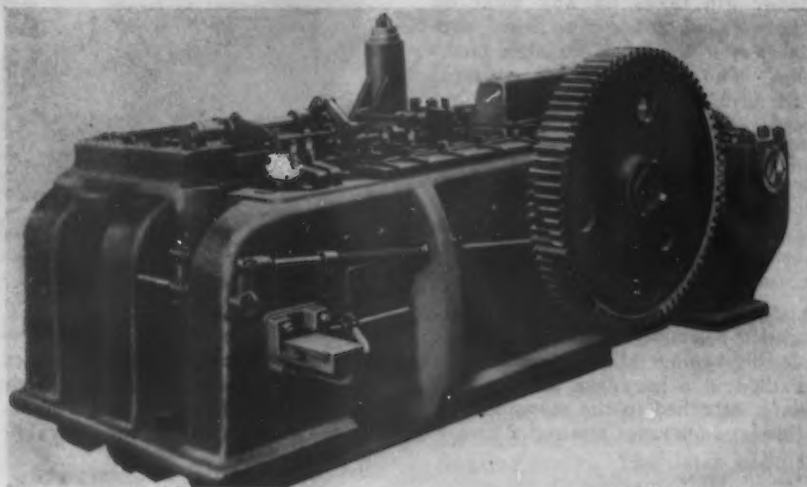


to allow a great variety of concaves or crowns to be ground on a roll. It is also available for finishing rolls having a number of different curvatures. This mechanism consists of an auxiliary bed, securely bolted to the rear base and supporting a traversing table which carries a camber bar. Motion to the camber table is transmitted by and synchronized with the machine table. Jack screws permit the camber bar to be set to the curvature which corresponds to the roll, or a bar of permanent form can be used when only one definite curve is necessary for all rolls.

A shoe, fixed to a tilting wheel-head casting, through an intermediate bracket, forms the contact between the wheel-head and the camber bar. As the camber bar traverses, the wheel is tilted toward or away from the roll, due to the bearing shoe riding on the bar.

Setting of the camber bar is simple, as the work is ground to the exact contour of the bar. A close reading indicator enables accurate checking of the amount of camber. Smooth movement of mechanism is provided by the heavy synchronizing drive. A single lever at the front of the machine engages or disengages the mechanism.

The cam-type cambering device consists essentially of a train of pick-off gears and a cam. These are driven by the machine table and a tilting wheel-head, which is operated by the cam. The change gears drive a shaft which extends through the bed and to which a cam is fixed at the rear. This cam operates a lever and plunger under the rear end of the wheel-head. The unit being mounted on trunnions, it tilted toward or away from the work as the cam rotates, thereby creating the desired concave or convex shape on the roll. A hydraulically-operated automatic backlash device is said to eliminate play from the entire mechanism. A single lever at the front of the table engages the mechanism.



All-Steel Cushioned Drive for New Model Forging Machine

A NEW all-steel forging machine, announced by the Acme Machinery Co., Cleveland, features a cushioned friction drive. In the type clutch employed, the flywheel is the only rotating member when the machine idles. A treadle pressure develops immediate movement without waiting for partial revolution of driving gear in starting and the same cushioned effect is operative in the stopping of the machine. Positive tool movement, to and from work, is designed to prevent back-lash and to eliminate heat-loss, in the metal being worked, due to waiting.

Clutch disks are of aluminum-alloy to gain the advantage of heat conductivity common to aluminum. The disks are cored to permit a constant flow of air through the center for dissipating friction-surface heat. On the smaller machine, 2 in. and under, the clutch and brake are mechanically operated by a single cam. On the larger machines a single air piston provides the means for control.

The bed is a steel casting, one piece, box type with longitudinal and transverse ribs. The integral main crankshaft bearings are so designed, that with crankshaft and caps in position, these members serve as added provision against bed spring. Cleanlined design for bed sides permits close operating positions.

The main shaft is of eccentric type. Shaft deflection is provided against by large bearing area in the sliding head, with bearings located close to the center line. It is said that a laboratory, photo-elastic, stress analysis has demonstrated that the eccentric shaft requires 300 per cent more pressure than the crank type to arrive at the same deflection.

The machines are double back-geared and have outboard bearings for most of the trunnion shafts. Increased gear ratio between crank and flywheel is provided by the double back gears. The flywheel

idles on large anti-friction bearings on the driving pinion shaft.

The Header Slide

The steel header slide is of suspended type with the horizontal surfaces in a single plane suspended on both sides of the shaft. The horizontal supporting surfaces are lined with bronze and slide on hardened and ground steel liners, fitted to the bed. Hardened and ground inserts are provided as bearings for large bronze faces of the sliding box. A long, adjustable taper gib takes up any wear on the vertical flat sliding head surfaces or in the large eccentric bushing. The design affords convenient adjustment between shaft and header slide.

Patented sliding head movement mechanism makes possible the large area sliding head as competitive with the Pitman type movement. Tool-lifting action is eliminated.

The movable steel die-slide suspended assembly is similar to that of the header slide. The die is cradled in a hardened and ground plate, attached to the movable die-slide, and operates against a breast

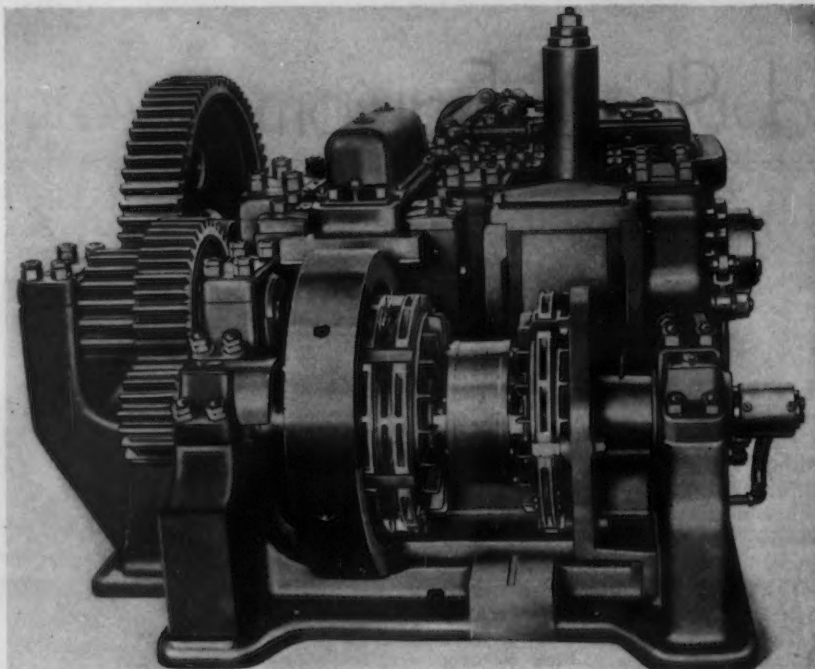


plate. This construction permits longitudinal adjustment to match position of stationary die and eliminates wear between the movable

die and the breast plate. Previous design is employed in the toggle slide, toggles and automatic relief units.

Millholland Offers New Turret Lathe

MILLHOLLAND SALES & MACHINE CO., Indianapolis, has announced new No. 5 and 6 Millholland turret lathes which embody a number of improvements over former design.

The equipment is designed to

permit use of hydraulic chuck, air chuck, and electrically operated chuck. Magazine feed can also be employed.

Optional headstock provides for either simplified gear drive with four speeds driven by a single or

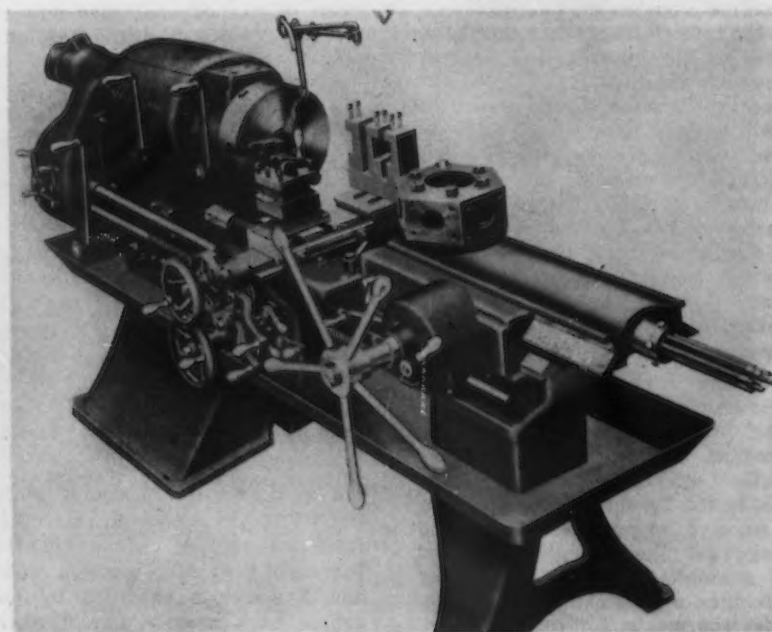
multi-speed motor, and variable speed devices, or single pulley drive, with twelve speed spindle, provided through a set of multiple disk clutches and one sliding gear. The sliding gear is only employed when the speed is changed from the higher to the lower range or vice versa. Spindle speeds are graduated from 22 r.p.m. to 1000 r.p.m.

Instantaneous speed change to any one of six spindle speeds, in either ratio range, is obtained by a speed control lever, without clashing of gear teeth. All gears in the headstock are in constant mesh, with the exception of the one sliding ratio gear.

The main spindle is an alloy steel forging, hollow-bored, and mounted on pre-loaded precision anti-friction bearings, spaced 27 in. apart, center to center. The main spindle has an automatic brake and spindle reverse. All shafts in the headstock are mounted on anti-friction bearings. Headstock gears are of hardened alloy steel, constantly oil sprayed.

Motor drive is furnished with flanged motor mounting, or V-belt drive. Push button control is within easy reach of the operator.

The carriage slides directly on a V-way bed. The apron is of flat construction, similar to a lathe apron.



The cross slide is constructed for carrying multiple tools for turning or facing, and can also be furnished with taper attachment for straight turning on front part of the slide and taper turning on the rear, without change. Multiple automatic stops are provided for turning and cross slide operations. A chasing attachment with lead screw can be used.

The turret slide is designed for fast operating with automatic hexagon turret indexing and clamping. Six automatic stops are provided for duplicate work. The turret slide or ram is of rigid structural shape, having a buttressed method of supporting the turret tools while under strain of coarse feeds at high spindle speeds. The slide is of deep-box girder form, with large dove-tail ways sliding in solid dove-tail bearings in the turret saddle. Only one taper gib, having substantial proportions and securely locked and sealed in place, is required for alinement and rigidity.

This taper gib is so interlocked with the turret saddle, as to become almost an integral part of the casting, yet adjustment is provided for.

The solid dove-tail slide has ways protected by an overhanging ledge, which also serves as a gutter to carry away coolant. It is provided with felt sealing strips and adequate wipers, to prevent coolant, chips and dirt from getting onto the ways at any time.

The capacity of the No. 5 machine is 1 1/4 in. diameter, bar work; 10 in. travel; swing over vees of bed 21 3/4 in.

The capacity of the No. 6 turret lathe is 2 1/2 in. diameter, bar work; 14 in. travel; swing over vees of bed 21 3/4 in.

A master collet with removable jaws is employed. The bar feed and collet-closing mechanism is operated by a single lever and is designed for fast operation at high spindle speeds without stopping the spindle.

sion and contraction should the spindle get warm. A take-up on the bearing assures permanent close fit.

The 3/4-hp. reversible motor employed is suspended within the housing of the machine. Two spare belts are suspended over the spindle so that if one belt should break, replacement may be made without loss of time. Both grinding wheels are thoroughly guarded with adjustable wheel-guards that also serve to protect against splash of the cutting lubricant.

Tilting Rotary Table For Jig Boring

PRATT & WHITNEY CO., Hartford, Conn., has placed on the market a new 10 in. tilting rotary table, designed for use with the company's No. 1A jig borer. The equipment, illustrated below, is for precision boring holes at exact angles as well as for boring work of a circular nature which is most easily laid out using polar coordinance. The scraped table is 10 in. in diameter, and contains standard work holding T-slots and an accurate hole in the center for locating work. The outer edge of the table is graduated in degrees for approximate indexing using a large rapid traverse handwheel. For exact setting a slow motion handwheel is engaged by a clutch knob. The large graduated dial and its vernier makes possible accurate indexing to two seconds. A non-influencing binder keeps the rotary movement locked solidly during boring.

The entire table is hinged at one side and can be tilted to any angle from zero to 90 deg. Graduations and a vernier provide for accurate setting to one minute. The tilting movement locks solidly during boring.

Super-precision ball bearings are used throughout. The table height in a horizontal position is 6 1/2 in., and its net weight is approximately 200 lb. Complete equipment, including proving bar, is supplied.

Diamond Grinder Has Reversible Motor Drive

REVERSIBLE driving motor, as well as self-contained and balanced construction, is a feature of the cemented-carbide tool grinder illustrated, which is built by the Wesson Co., Detroit. The reversible motor drive arrangement enables the operator to work from both sides of the grinding wheel, giving a stroke upward or downward. The coolant pump, which with the sump pan is located on the lower part of the machine, is also reversible. Electrical equipment includes a protective switch

that prevents reversal while the motor is running.

The machine is equipped with two wheels, one of which is of diamond type for finishing and reconditioning carbide-tipped tools. It weighs 900 lb. and the balanced construction is said to eliminate vibration and the necessity for strapping the machine down to the floor.

Spindle is ball-bearing mounted and is said to be of a material that practically does away with expan-



AT LEFT

REVERSIBLE motor drive provides the convenience of operating from either side of this diamond grinder.

AT RIGHT

A LARGE graduated dial and its vernier is said to make possible accurate indexing to two sec. through the use of this new tilting rotary table in connection with jig-boring operations.



Small Welder Features Combined Operations

A COMBINATION cutting, welding and trimming machine to cope with the tendency of flexible shafts and stranded wire and cable to unravel has been brought out by the Eisler Engineering Co., Inc., 754 South Thirteenth Street, Newark, N. J. The machine range is up to 0.250 in. diameter in ferrous or non-ferrous metals and the material handled may be either twisted or helically coiled. The assembly of units, as illustrated below, provides that the work may be cut apart and rejoined or that two pieces may be joined and trimmed without unraveling and with practical assurance that prior flexibility will be maintained. The equipment operates on either 110 or 220 volt, alternating current, and may be bench mounted or furnished with portable pedestal mounting.

A special annealing device for welded stranded wire; a slide adjustment for closely regulating welding current; foot operated clamping jaws for work holding; a reflector work lamp and an especially designed grinder or trimmer for trimming, are provided.

In cutting apart, flexible shaft or cable work is clamped in the welding jaws. Application of current welds the strands together

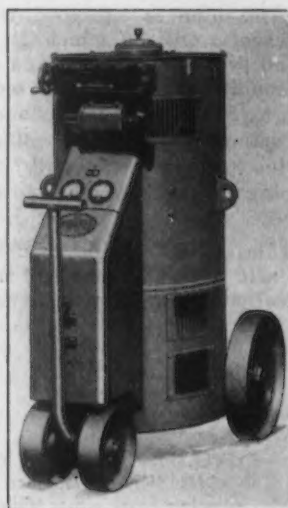
and finally severs the cable. The ends of the cable are then placed in the trimmer, which is equipped with a carborundum wheel driven by a 1/20 hp. motor, and finished off.

In welding, the ends are first prepared as above and then welded together, and placed in the annealer, after which the cable is inserted in an automatic centering device of the trimmer and the burrs of the joint ground off.

The equipment will handle, in addition, either square or round solid rods, bar or wire.

Portable Arc-Welders In New Vertical Design

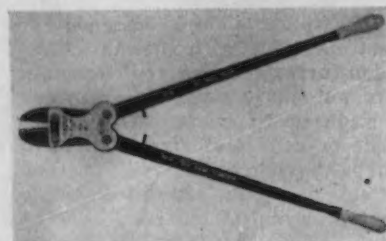
A NEW line of vertical, portable arc-welders, built by the J. D. Adams Co., Indianapolis, features gyroscopic stabilization of dynamically balanced rotating parts. The armature shaft is mounted on over-size angular thrust ball bearing at top and double-race, self alining, radial ball bearing at lower end.



This assembly is effective against both vibration and end float. Air intake is at the top of the housing, 40 in. from the floor line. The exhaust is through bottom louvres. The design provides a low center of gravity with resulting handling convenience over rough areas. Brushes are rigidly held on commutator at all times. Exciter and main brushes are shifted simultaneously by screw feed which provides extreme flexibility in current control. Heavy-duty polarity reversing plug and receptacle provide quick method of reversing polarity, guard against accidental reversal while welding, and clearly indicate settings at all times.

New Box Strap Shear

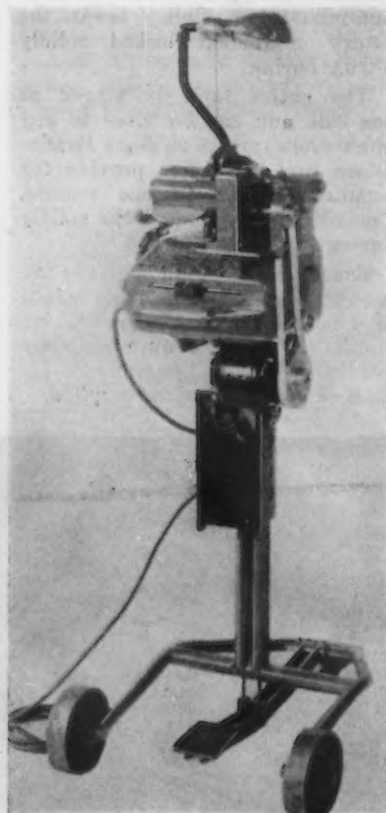
A NEW patented "Helwig" strap shear, having a lever purchase of 18,000 lb., is being marketed in three sizes by the Helwig Mfg. Co., St. Paul, Minn. Capacities are indicated by blade sizes: No. 2, 2½ in.; No. 3, 2 in.; and No. 4, 1½-in. blades. Simplicity of



the tool and ease of operation for metal box strapping and like work is featured. Quality of materials and workmanship common to previous models is maintained.

Small All-Steel Plate Welded Punch Press

WHITNEY METAL TOOL CO., Rockford, Ill., is marketing a new all-steel plate welded punch press shown below. The length of stroke is 1½ in., depth of throat 8 in., die space with stroke down, adjustment up, 4 in., three station clutch pin dogs in flywheel. Double V-belt drive is employed, speed of 20-in. flywheel is 135 r.p.m.





NEWS OF THE WEEK

Single Operating Company May Be Final Aim of Steel Corporation

CONSOLIDATION of all the subsidiaries of the United States Steel Corp'n. into a single operating company is now regarded as a possible ultimate sequel of the impending unification of the Carnegie and Illinois steel companies under the direction of Benjamin F. Fairless. While no further information has been given out as to Mr. Fairless' assignment or the title that he will assume, it is pointed out the announcement of his departure from the Republic Steel Corp'n. came before the United States Steel Corp'n. was ready to give out details as to its plans for amalgamating subsidiary organizations.

It is evident, of course, that unification of the Illinois and Carnegie companies will in no way lighten the operating responsibilities at Chicago and Pittsburgh. In both districts it will be necessary to have the highest type of management, and this is especially true at a time when organized labor is making a most powerful effort to gain a foothold in the steel industry. Though new titles may have to be provided, it is patent that men on a par with the incumbent presidents of the two subsidiaries will have to continue to direct operations. At Chicago, it is possible that G. G. Thorp, present president, will retire. He is past the age of voluntary retirement and is understood to have submitted his resignation to 71 Broadway some time ago. The operating vice-president of Illinois Steel Co. is G. C. Kimball.

Amalgamation of Illinois and Carnegie would complete the unification of subsidiaries by products except for Alabama and the Pacific Coast, where district amalgamation of corporation plants is in effect. Subsequent corporate amalgamation of all the product subsidiaries would, it is reasoned, be

the logical final step. Presumably the headquarters of the united operating organization would be at Pittsburgh. Presumably also, the

consumption of this end would be followed by the passing of the New York holding company, the present United States Steel Corp'n.

Though all of these reports are conjectural, they have a realistic ring in view of growing political pressure against holding companies.

August Daily Steel Ingot Production 24 Per Cent Above July Rate

AVERAGE daily steel ingot production of 108,123 gross tons during August was nearly 24 per cent higher than in July and more than 110 per cent above August of last year, according to the American Iron and Steel Institute. Daily production in August was exceeded this year in only February and March.

Total production in August of

2,919,326 gross tons of ingots was the highest to date in 1935 because August had 27 working days compared with only 24 in February and 26 in March.

The steel industry operated at 48.84 per cent of daily capacity in August, compared with 39.44 per cent in July and with 23.24 per cent in August, 1934.

REPORTED BY COMPANIES WHICH IN 1934 MADE 97.91 PER CENT OF THE OPEN-HEARTH AND 100 PER CENT OF THE BESSEMER INGOT PRODUCTION

	Reported Production (Gross Tons)		Calculated Monthly Production— All Companies		Number of Work- ing Days	Per Cent of Opera- tion
	Open- Hearth	Bessemer	Monthly	Daily		
1934						
January	1,786,458*	172,489	1,997,129†	73,968†	27	33.59†
February	1,993,465*	175,873	2,211,944†	92,164†	24	41.86†
March	2,540,243*	203,904	2,798,440†	103,646†	27	47.07†
April	2,622,531*	257,482	2,936,064†	117,443†	25	53.34†
May	3,003,676*	331,620	3,399,494†	125,907†	27	57.18†
June	2,718,782*	282,592	3,059,483†	117,672†	26	53.44†
July	1,340,924*	119,869	1,489,453†	59,578†	25	27.04†
August	1,246,139*	109,598	1,381,350†	51,161†	27	23.24†
Eight months	17,251,218	1,653,427	19,273,357	92,660	208	42.09
September	1,127,269*	117,615*	1,268,977†	50,759†	25	23.05†
October	1,325,777*	127,789	1,481,902†	54,385†	27	24.93†
November	1,447,626*	132,059	1,610,625†	61,947†	26	28.13†
December	1,794,437*	131,467*	1,964,257†	78,570†	25	35.68†
Total	22,946,327*	2,162,357*	25,599,118†	82,312†	311	37.38†
1935						
January	2,576,671	239,358	2,871,531*	106,353*	27	48.04*
February	2,500,062	224,336	2,777,765*	115,740*	24	53.28*
March	2,582,211	230,810	2,868,141*	110,313*	26	49.32*
April	2,358,249	231,916	2,640,504*	101,558*	26	45.87*
May	2,331,297	254,796	2,635,857*	97,624*	27	44.10*
June	1,978,180	210,487	2,230,893	89,236	25	40.31
July	2,003,011	224,456	2,270,324	87,316	26	39.44
August	2,629,828	233,361	2,919,326	108,123	27	48.84
Eight months	18,959,509	1,850,020	21,214,241	101,992	208	46.07

*Revised.
†Adjusted.

Iron and Steel Exports Continue to Rise in July

Exports (In Gross Tons)	July		Seven Months Ended July	
	1935	1934	1935	1934
Pig iron.....	122	61	1,543	1,953
Ferromanganese.....	4	2	39	18
Iron and steel scrap.....	205,779	155,812	1,321,721	894,660
Tin plate scrap ⁵	2,957	.....	26,102	.....
Waste-waste tin plate.....	1,100	.....	16,239	.....
Pig iron, ferroalloys and scrap.....	209,962	155,875	1,365,644	896,631
Ingots, blooms, billets, sheet bars.....	1,718	79	29,998	8,716
Skelp.....	10,500	9,665	17,266	50,450
Wire rods.....	2,824	576	13,986	16,374
Semi-finished steel.....	15,042	10,320	61,250	75,540
Steel bars.....	5,993	2,488	31,910	24,198
Alloy steel bars.....	152	136	1,332	1,845
Iron bars.....	44	47	658	601
Plates, iron and steel.....	3,608	3,717	22,778	21,374
Sheets, galvanized steel.....	7,235	5,551	45,107	36,317
Sheets, galvanized iron.....	343	113	1,066	886
Sheets, black steel.....	7,506	7,670	60,876	50,361
Sheets, black iron.....	278	879	3,214	2,725
Hoops, bands, strip steel.....	3,627	2,556	24,959	19,164
Tin plate and taggers' tin.....	9,639	13,960	63,334	111,097
Terne plate (including long ternes) ⁵	46	.....	1,403	.....
Structural shapes, plain material.....	2,963	2,663	17,378	16,952
Structural material, fabricated.....	1,807	1,025	14,350	10,134
Tanks, steel.....	716	430	3,708	4,152
Steel rails.....	7,611	4,229	26,782	46,983
Rail fastenings, switches, spikes, etc.....	957	974	5,754	11,591
Boiler tubes.....	476	396	5,255	3,789
Casing and oil line pipe.....	2,648	4,984	19,314	39,467
Pipe, black and galvanized, welded steel.....	2,528	3,428	21,691	25,987
Pipe, black and galvanized, welded iron.....	132	165	1,979	1,320
Plain wire.....	2,553	3,241	21,232	21,908
Barbed wire and woven wire fencing.....	3,905	3,033	19,483	22,468
Wire cloth and screening.....	100	83	614	482
Wire rope.....	329	248	2,537	1,687
Wire nails.....	1,277	809	6,148	8,382
Other nails and tacks.....	412	400	2,196	3,091
Other wire and manufactures.....	620	444	3,077	2,972
Bolts, nuts, rivets and washers, except track.....	536	427	3,804	2,817
Other finished steel.....	88	120	795	1,009
Rolled and finished steel.....	68,129	64,216	433,234	493,759
Cast iron pipe and fittings.....	870	712	8,259	8,107
Malleable iron screwed fittings.....	249	246	1,839	1,726
Car wheels and axles.....	430	491	11,837	2,338
Iron castings.....	1,344	711	5,735	4,626
Steel castings.....	371	231	1,628	1,233
Forgings.....	405	395	3,310	2,407
Castings and forgings.....	3,669	2,786	32,608	20,437
Total.....	296,802	233,197	1,892,736	1,486,367

Imports (In Gross Tons)	July		Seven Months Ended July	
	1935	1934	1935	1934
Pig iron.....	5,519	2,997	59,005	68,383
Sponge iron.....	.....	53	666	743
Ferromanganese and spiegelisen ¹	5,962	2,551	28,490	19,608
Ferrosilicon ²	38	46	556	577
Other ferroalloys ³.....	.....	.....	1	46
Scrap.....	1,584	933	13,640	28,135
Pig iron, ferroalloys and scrap.....	13,103	6,611	102,359	117,557
Steel ingots, blooms, etc.....	35	35	1,067	698
Wire rods.....	937	791	8,111	7,523
Semi-finished steel.....	972	826	9,178	8,221
Concrete reinforcement bars.....	721	336	1,529	818
Hollow bar and drill steel.....	102	131	573	466
Merchant and other steel bars.....	477	1,881	3,307	11,077
Bars whether solid or hollow ⁴	1,776	.....	4,857	.....
Iron slabs.....	.....	.....	.....	1
Iron bars.....	284	163	918	509
Boiler and other plate.....	79	47	246	128
Sheets, skelp, and saw plate.....	681	378	4,663	2,563
Tin plate.....	5	15	106	83
Structural shapes.....	3,122	1,665	20,603	11,920
Sheet piling.....	.....	.....	.....	1,109
Rails and rail fastenings.....	819	254	2,463	1,880
Welded pipe.....	492	154	1,407	1,177
Other pipe.....	1,777	104	9,893	1,871
Cotton ties ⁵	2,211	.....	3,954	.....
Other hoops and bands.....	1,290	1,868	12,364	9,498
Barbed wire.....	1,390	1,098	14,712	6,506
Round iron and steel wire.....	224	315	2,408	1,673
Telegraph and telephone wire.....	3	20	20	2
Flat wire and strip steel.....	65	132	363	835
Wire rope and strand.....	138	166	1,058	873
Other wire.....	187	131	624	517
Nails, tacks, and staples.....	1,841	1,198	10,333	4,701
Bolts, nuts, and rivets.....	28	1	226	167
Horse and mule shoes.....	35	37	381	268
Rolled and finished steel.....	17,747	10,074	102,513	58,642
Malleable iron pipe fittings.....	.....	.....	46	.....
Cast iron pipe fittings.....	.....	4	27	11
Castings and forgings.....	72	161	662	866
Total, gross tons.....	31,894	17,676	214,785	185,297

¹ Manganese content. ² Chrome content. ³ Silicon content. ⁴ Alloy content. ⁵ New class, no comparable figures for 1934 or previous years. ⁶ New classification as result of the Reciprocal Trade Agreement with Belgium. No comparable figures for previous month or year.

INCREASING for the fourth consecutive month, exports of iron and steel products from the United States rose to 296,802 gross tons in July, gaining 7115 tons over the June trade and drawing closer to the 323,035-ton record level of last March.

While scrap continued to be the dominant commodity in this trade, the actual tonnage exported declined 9319 tons to 205,779 tons while exports of finished and semi-finished materials increased 22 per cent to 91,023 tons.

Over the elapsed seven months of 1935, export shipments of iron and steel have totaled 1,885,621 gross tons, 399,254 tons or 26.8 per cent more than was exported in the comparable period of 1934 and more than was exported in the entire calendar years 1931, 1932 and 1933, and nearly as much as was exported (on a tonnage basis) in the whole of 1930.

For the second consecutive month, imports of iron and steel products recorded a decline. The July total of 31,894 tons dropped 3.9 per cent under June receipts. This tonnage, however, was considerably greater than the July, 1934, trade, while the 214,785-ton total during the elapsed seven-month period gained 16 per cent over that for the corresponding period of last year.

Sources of American Imports of Iron and Manganese Ores (In Gross Tons)

	July		Manganese Concentrates 35 Per Cent or Over	
	1935	1934	1935	1934
Canada ..	1,560	44	.....	337
Cuba	22,500	22,000	.....	.....
Chile	66,000	109,100	.....	154
Spain .....	.....	.....	.....	.....
Norway	15,625	27,231	.....	.....
Russia	22,800	16,205	4,161	3,933
India .....	.....	.....	2,240	2,604
Brazil .....	.....	.....	.....	1,475
West Africa .....	.....	6,000	9,669	1,276
French Africa .....	.....	.....	.....	.....
Australia	20,122	.....	.....	.....
United Kingdom .....	.....	.....	.....	.....
Other Countries	5,236	15,460	56	14
Total	153,743	196,130	16,126	9,793

United States Imports of Pig Iron by Countries of Origin (In Gross Tons)

	July		Seven Months Ended July	
	1935	1934	1935	1934
United Kingdom	1,148	50	12,499	200
British India.....	3,257	2,352	14,752	20,080
Germany	50	.....	150	.....
Netherlands.....	276	536	19,041	41,202
Canada	463	.....	6,052	4,664
France .....	.....	.....	50	.....
Belgium .....	.....	.....	100	50
Norway	25	.....	1,787	962
Sweden	100	.....	547	265
Russia	200	.....	3,173	.....
All others	59	.....	854	960
Total	5,519	2,997	59,005	68,383

Huge Coast Reinforcing Tonnage Distributed Among Mills

LOS ANGELES, Sept. 9.—In placing awards for 83,790 tons of reinforcing steel with local jobbers the Metropolitan Water District specified in each award

the tonnage and mill from which the steel was to be purchased. The mills and various tonnages were as follows:

Mill	Reinforcing	
	Rail	Billet
Republic Steel Corpn.....	5,000	6,000
Bethlehem Steel Co.....	5,000	2,000
Laclede Steel Co.....	4,000	.....
Connors Steel Co.....	2,000	.....
Carnegie Steel Co.....	3,000	1,000
Illinois Steel Co.....	2,610	6,000
Sheffield Steel Corpn.....	1,000	3,000
Tennessee Coal, Iron & Railroad Co.....	.....	4,000
Columbia Steel Co.....	.....	4,000
Pacific Coast Steel Corpn.....	.....	4,000
Judson Steel Corpn.....	.....	2,000
Youngstown Sheet & Tube Co.....	.....	2,180
Inland Steel Co.....	2,000	2,000
Pollak Steel Co.....	2,000	.....
Knoxville Iron Co.....	4,000	.....
Texas Steel Co.....	1,000	.....
Simmons Steel Co.....	2,000	.....
Colorado Fuel & Iron Co.....	.....	4,000
Missouri Rolling Mill Corpn.....	1,000	.....
Gulf States Steel Co.....	.....	1,000
Jones & Laughlin Steel Corpn.....	.....	8,000
Kilby Car & Foundry Co.....	1,000	.....
Totals	34,610 tons	49,180 tons

Largest Diesel Locomotive Put Into Service

THE Atchison, Topeka & Santa Fe Railway has taken delivery from the Electro-Motive Corp. of the most powerful Diesel locomotive ever placed in service. It will haul the road's crack flier, The Chief, between Chicago and California, on a faster schedule than at present. Conservatively rated at 3600 hp., weighing 240 tons, and having an approximate over-all length of 127 ft., the Santa Fe's new locomotive overshadows any

previous application of Diesel power to light streamlined trains, to rail cars, or to relatively light switching locomotives. Actually it is a multiple unit of two identical sections, which can be operated singly or together, or coupled to any desired number of similar units, all of which can be controlled by a single operator.

The body construction and outside sheathing of the locomotive are of copper-bearing rolled steel. The

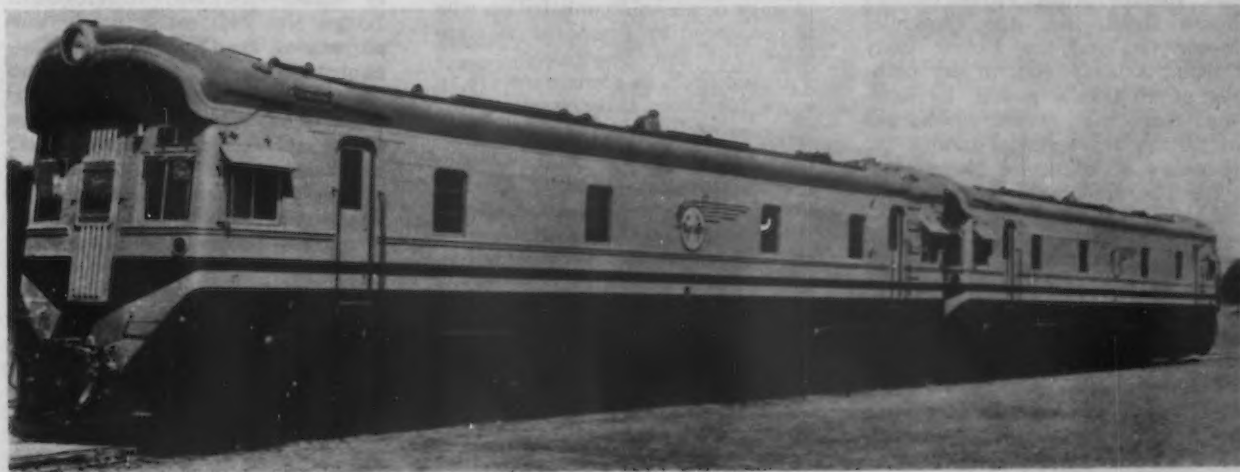
engine bed plate is of Cromansil steel. The underframes and trucks are of cast steel.

In appearance the new locomotive is unique. A pleasing effect of streamlining has been obtained for the twin units by skillful modifications in the steel jackets that hide every detail of engineering apparatus; by the molding and slope of the rather blunt ends; the flowing steel "skirts," with removable sections, that cover the wheels and underbody, and the skillful handling of an attractive color scheme in black, cobalt and sarsaparilla blues, golden olive and pimpernel scarlet, worked out by the art and color department of the General Motors Corp., of which the Electro-Motive Corp. is a subsidiary.

Motive power of each unit of the locomotive is supplied by two Winston V-type, 12-cylinder high-compression, two-cycle oil engines. Since each engine is conservatively rated at 900 hp. the two units provide a total of 3600 hp., all available for traction purposes.

These engines are extremely light in weight, weighing less than 20 lb. per horsepower. The fuel used is a comparatively inexpensive Diesel fuel oil, 1600 gal. of which can be carried.

The running time of the Santa Fe's transcontinental flier, The Chief, which for years has made the 2225 miles between Chicago and Los Angeles in several hours less time than any other train, has steadily been cut down from the 61 hr. of 1926 to the existing schedule of but 53 hr. 45 min. The Diesel should prove capable of improving this schedule because of its greater adaptability to track conditions and elimination of fuel stops and engine changes. The maximum safe speed of the new engine has been set at 98 miles an hour, a figure frequently equaled or exceeded by steam locomotives for short distances.





BY L. W. MOFFETT

Resident Washington Editor,
The Iron Age

WASHINGTON, Sept. 10.—Organized labor has already set to work the Wagner-Connery labor disputes act beyond union hours. . . . Concentrating on the steel, automotive and textile industries the American Federation of Labor turned quickly to the much disputed disputes law to renew its drive to gain labor control of these major industries. . . . Even before it was organized, the National Labor Relations Board was made the repository of charges which blew up when the Supreme Court made a statistical pigeon of the Blue Eagle. . . .

To the ever-alert Argus-eyed Charlton Ogburn goes the capital award of three lusty huzzas for being the first on the job. . . . Against the Portsmouth, Ohio, plant of the Wheeling Steel Corp., the Bendix Auto Parts Corp., South Bend, Ind., the Chevrolet Motor Co. and the Fisher Body Corp., Atlanta, Ga., to say nothing of 15 textile plants, he hastened forth with revamped charges of failure to recognize unions for purposes of collective bargaining. . . . The steel case was filed on behalf of the Amalgamated Association of Iron, Steel and Tin Workers, which some prominent A. F. of L. leaders charge is slow on the trigger and short of aggressiveness in organizing steel. . . . Calling it boring from within or what have you, these leaders are straining at the leash as they push for new blood in the Amalgamated. . . . It is possibly a reflection of

THIS WEEK IN WASHINGTON

Organized labor is quick to seize opportunities offered by Wagner-Connery Bill.

o o o

Early move is a snap at the hand that feeds as Dr. Tugwell is asked to reinstate a professor in his department.

o o o

New NRA legislation seems assured at next session of Congress.

o o o

President's promise to give business a "breathing spell" provokes wide comment.

o o o

Public work allotments increase as deadline for new grants approaches.

the merry quarrel within the A. F. of L. between craft and industrial unions. . . .

Charges against the General Motors subsidiaries were made on behalf of the United Automobile Workers which is also engaged in a jurisdictional wrangle with thumbs down on Frank Dillon who is sponsored by President William Green of the Federation. . . . Further cases in abundance are in store for these three large industries as well as for many others before the law faces court tests. . . .

Simultaneously with official announcement of the demise of the Blue Eagle by the one-time puissant National Recovery Administration last Thursday, the weary spirit of the one-time tumultuous old storm bird took flight to the Walsh mansion in elite Massachusetts Avenue. . . . There, amid fine tapestries and oil paintings, it was as haunting as Poe's Raven. . . . No respecter of persons, with pre-

sumption and without compunction, it hovered over and ruffled the classic brow of the scion of brain trusters, Dr. Rexford G. Tugwell. . . . Figuratively, it provoked an intramural and lively brain-trust scrap. . . . For gathered before Dr. Tugwell was an American Federal of Labor Affiliate, Resettlement Lodge No. 206, made up of employees of Dr. Tugwell's own alphabetical agency. . . . Demand was made for reinstatement of Dr. William E. Zeuch, dismissed by Dr. Tugwell, and dismissed also about 16 months ago from an executive position in the Subsistence Homestead Division of the Department of Interior by Secretary Harold L. Ickes. . . . Union resolutions attacked Brain Truster Tugwell for "acceding to the request of Interior Secretary Ickes to blacklist" Dr. Zeuch, former instructor in economics at the universities of Indiana, Cornell, Wisconsin and Illinois. . . . In declining to disclose reasons for Dr.

Zeuch's dismissal, said the union, Dr. Tugwell has violated "fundamental tenets of collective bargaining" and it announced plans for "public pressure" against Dr. Tugwell in the way of nation-wide union backing with petitions, speeches, the radio, newspapers and magazines to give due publicity to the squabble. . . . The chicken came home to roost, as it were. . . . An NRA union once attempted to bedevil Gen. Hugh S. Johnson but, aside from staging a picketing parade, it got nowhere. . . . And that was when the old bird was shown some respect. . . .

Belated confirmation of the report of the fatal bludgeoning of the Blue Eagle by the Supreme Court, May 27, was given in an administrative order by Acting NRA Administrator L. J. Martin. . . . The order forthwith cancelled authorized reproduction of Blue Eagle insignia or emblems. . . . Notice was served on all and divers persons that all such insignia or emblems are the property of the United States Government and are protected by patent. . . .

Embalmed and placed in Smithsonian Institution though the Blue Eagle might be, the New Deal's promise of a breathing spell for business clearly does not mean it has abandoned the idea of a resurrected NRA with as much potency as the Supreme Court will permit. . . . For coming on the heels of the President's message on the last day of the recent session of Congress for NRA legislation at the next session is an NRA bulletin setting forth a program. . . .

Among points being studied are Federal control through employment of the power of taxation; Federal regulation through employment of treaty power; due process of law; State recovery legislation in aid of N. I. R. A.; problems relative to the anti-trust laws; Federal power to regulate commerce among the several states; and Federal control through employment of so-called spending power. . . .

Speculation has been aroused as to whether Federal control such as is to be attempted for the bituminous coal industry under the Guffey-Snyder (little NRA) act is contemplated. . . . The method provided in this legislation, already in court for test as to its constitutionality, is through the taxing power. . . . Among those who joined in the voluminous attacks on this act was Senator Tydings, democrat, of Maryland, who has said it would not last 10 minutes in the Supreme Court. . . . But the bituminous coal industry, including many operators who bitterly opposed the legislation when it was

under consideration, has announced through the National Coal Association that it will cooperate with the Government in administering the act. . . . It is perhaps safe to say that those operators who opposed the legislation are still of the same mind and realize that though pledging cooperation with the Government they will get the satisfaction of seeing the act tested in court without having to take the responsibility that goes along with the litigation. . . .

The NRA bulletin suggestion as to treaties with States and the use of spending power brings out something new, since this method has never been applied. . . . But all old ways are outmoded and experimentation continues to survive despite promises of a letdown on it. . . . In these days of riotous pouring out of billions there can be no doubt as to spending power, but the NRA suggestion apparently means Federal doles to the States in return for fixing of wages and hours by States. . . . The thought would seem to be that this would provide a way round the commerce clause. . . .

Supporting the Administration drive for new NRA legislation again comes the mighty voice of organized labor. . . . Or can it be that the Administration is supporting organized labor? . . . In any event another chapter in organized labor's wordy barrage for revamping NRA was added last week when President Green of the A. F. of L. rushed a telegram to the Connecticut Federation of Labor telling the State federation to adopt a resolution calling on Congress to pass at its next session a new recovery act "which will conform to Supreme Court decision and a bill for that purpose has been introduced in Congress." . . . Mr. Green had in mind organized labor's familiar bill to license industry. . . . He probably had in mind too court dangers facing such pet measures of organized labor as the Wagner-Connery and Guffey-Snyder acts, hoping for another shield just in case. . . . Rallying tenaciously to the NRA cause also was General Johnson who in an address before the Indiana Bar Association demanded a "fundamental interpretation of the constitution" to restore NRA. . . . Unwilling to give up his own recovery child, though admitting it needs washing, the doughty general, declaring the unemployment problem is worse than ever, insisted that "it can only be solved by some revival of at least the principles of NRA." . . . Sponsors for another NRA persistently disregard the fact that it had pretty well broken down even before the

Supreme Court decision. . . . That those industries which adhered to code wages and hours before the act was declared invalid largely are still doing so. . . .

Screaming headlines announcing the President's promise of a breathing spell for business brought an upward shot of stock and commodity prices, if that means anything. . . . and a mixed reaction in business circles. . . . Taken by some really to indicate a quick shift from the left to the right, others pointed out that they would hold their breath to see if the Presidential idea actually accords with that of business, explaining that in the past some promises, including those in the Democratic platform of 1932, had been thrown into the ash can. . . . Brought forth as a reply to a straightforward letter from Roy W. Howard, chairman of the board of Scripps-Howard newspapers, the Hyde Park statement would have afforded more comfort if it had been more specific. . . . It is too much to say it removed uncertainties and certainly it did not eliminate encumbrances which the New Deal's plethora and muddled activities have placed on business. . . . But some hope developed from the President's statement that the "basic program" of the New Deal had been completed, though it left doubt as to the precise significance of the hard-worked term "basic." . . . There cropped up the wishful interpretation that the fast-moving, befuddling legislative circus of the past two years is over and that the next Congressional performance will have no clown acts. . . . Mr. Howard, whose newspapers are pro-New Deal, frankly told the President "that certain elements of business have been growing more hostile to your Administration is a fact too obvious to be classed as news." . . . The editor said he was seeking reasons for "doubts and uncertainties of business men . . . at a time when there is no commensurate dissatisfaction by others of the electorate." . . .

Heretofore the New Deal would not publicly acknowledge this growing business hostility . . . it could not be that it was blissfully unaware of this feeling. . . . The President did not directly acknowledge such hostility except that "emanating from financial racketeers, public exploiters and sinister forces," criticism which "it is an honor to bear." . . . But he said he did realize "that the many legislative details and processes incident to the long and arduous sessions of Congress have had the unavoidable effect of promoting some confusion in many people's minds." . . . The

President stated the case mildly to say the least and there will continue to be sharp differences among the conclusions he drew, such as those concerning his tax program. . . . It is regrettable too, that the President said nothing to relieve increasing concern over enormous Government expenditures and over failure to balance the budget. . . . There will be a distinct challenge of the President's statement that "we do claim that we have helped to restore that public confidence which now offers so substantial a foundation for our recovery." . . . It is well known that there is sentiment in business, that instead of restoring public confidence the New Deal had almost wrecked it and that recovery under way is due to private initiative and in spite of the New Deal. . . . There is solace, however, in the Presidential disavowal of claim to the magician's wand. . . . For if an end has come to the days of legerdemain, of pulling white rabbits out of the hat and of crystal gazing there will be occasion for rejoicing despite cynical claims of New Deal opponents that the statement is a campaign document and seeks to recapture business votes which have strayed from the fold. . . . Meanwhile business will adopt an attitude of watchful waiting. . . . The test of the pudding. . . .

Meanwhile the WPA and the PWA friction between Harry L. Hopkins and Mr. Ickes over use of the works funds grows. . . . Meaning that Frank Walker, executive director of the National Emergency Council is not to be envied in his role as umpire of the disputes. . . . Mr. Hopkins wants to break programs into small separate projects to give direct relief to the largest possible number of unemployed, while Mr. Ickes holds to the idea of making single projects out of certain programs for the purpose of spreading the work not only to those on relief but to industries and their employees. . . . And question though one may certain policies of Mr. Hopkins and Mr. Ickes there is no gainsaying their good intentions. . . . Mr. Hopkins in particular is in the unhappy position of being bitterly assailed for not moving war veterans from FERA camps in Florida in time to prevent the frightful loss of life they suffered from the hurricane but he blames alleged indefinite weather reports, with the Weather Bureau hotly claiming it had given ample and adequate warning. . . . The ghastly disaster has brought widespread and sharp reaction against the New Deal, whether justified or not. . . .

Political opinion of any variety wanted is on tap in increasing

abundance as the Presidential campaign swings into a faster tempo. . . . Observers for the most part will see what they want to see . . . at least when giving out public statements they will paint an alluring picture of utmost confidence. . . . The certainty of the reelection of Mr. Roosevelt is already a foregone conclusion, says James A. Farley, sometime Postmaster General, and at all times chairman of the National Democratic Committee. . . . On the other hand some Republican lieutenants say they doubt that Mr. Roosevelt can be as much as renominated . . . but if renominated he and the whole New Deal will be overwhelmingly swept out of office. . . . Such observations of course are as dubious as are the several strained relations between the United States and Bolshevik Russia. . . .

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Labor Board Is Organized

Organization of the newly set up National Labor Relations Board was effected last Friday at a meeting of its members and the 17 regional board directors. It was stated that the regional directors generally will examine facts in charges filed to determine whether or not formal complaints will be issued on behalf of the board. Hearings will be held before directors in regions where charges arise. The board in Washington will conduct hearings only on appeals from decisions of regional boards. The National Labor Relations Board has its offices in the new Department of Labor building.

Will Dismantle Steel Works at Cleveland

THE American Steel & Wire Co. is dismantling the seven 60-ton open-hearth furnaces and two 15-ton Bessemer converters of its Newburgh Steel works in Cleveland. Contract for tearing down the furnaces has been placed with the Hetz Construction Co., Niles, Ohio.

A few months ago the company began dismantling two of the four Central blast furnaces in Cleveland. The open-hearth furnaces at the Newburgh works were shut down about two years ago and since that time the company has been shipping billets to Cleveland from the Lorain works of the National Tube Co.

Machinery & Welder Corp., St. Louis, has opened office and warehouse at 729 Third Avenue, Moline, Ill. H. C. Kelsey, formerly in Chicago office, has been appointed district manager.

Public Works Projects Total \$89,000,000

WASHINGTON, Sept. 10.— Presidential approval of 184 local non-Federal construction projects in 31 States was given last week upon recommendation of the Advisory Committee on Allotments, the loans and grants totaling \$88,833,098. Grants totaling \$49,997,798 to cover 45 per cent of the estimated cost of all projects in the list were approved and the money has been allocated to the Public Works Administration. The grants will be paid out of the new works-relief appropriation. Loans will be made from the PWA revolving fund.

On 53 out of the 184 projects the applicants also asked for loans totaling \$38,835,300 to cover the remainder of the cost of their projects above the 45 per cent grant. Applications for the loans are under study by the PWA and, it was announced, will be made if it is found that the applicants are able to offer bonds that will give reasonable security. Of the loans requested \$24,523,000 was asked for by Los Angeles, while that city also requested grants totaling \$26,617,908.

The Los Angeles and other major projects follow:

Los Angeles: Loan and grant of \$22,532,727 to Board of Education for reconstructing, rehabilitating and equipping 452 earthquake and fire proof school buildings. Loan, of \$12,393,000; grant \$10,139,727; construction estimated to require 20 months.

Loan and grant of \$13,963,636 to city for construction and reconstruction of cargo terminals, ferry landings, market buildings, piers and other harbor improvements; loan, \$7,680,000; grant, \$6,283,636; project approved on condition that construction be completed by July 1, 1936.

Grant of \$6,480,000 to Department of Water and Power for additions and improvements to Los Angeles water system comprising construction of tunnels, dams, conduits, reservoirs and other necessary structures, all estimated to cost \$14,000,000; project approved on condition construction be completed by July 1, 1936.

Bayonne, N. J.: loan and grant of \$5,454,545 to city for construction of dock and ship-to-railroad terminal; loan, \$3,000,000; grant, \$2,454,545; construction estimated to require 19 months.

Buffalo: loan and grant of \$15,000,000 to Buffalo Sewer Authority for intercepting sewers, storm water relief sewers and sewage treatment plant; loan, \$8,250,000; grant, \$6,750,000; project approved on condition construction must be commenced within 60 days after announcement and be completed within one year, the cost per man year not to exceed \$1,200.

Niagara Falls, N. Y.: grant of \$1,035,000 for sewage disposal system

estimated to cost \$2,300,000 and comprising sewage treatment plant, diversion dams at sewer outlet, interceptor tunnels and provision for diverting excessive storm flows and industrial wastes; construction estimated to require 12 months.

New York: grant of \$1,397,250 for constructing and equipping three ferry boats, estimated to cost \$3,105,000.

Chattanooga, Tenn.: loan and grant of \$1,272,727 to Hamilton County for school construction improvements to court house and new building for colored insane, equipment to be purchased for all buildings. Loan, \$700,000; grant, \$572,727; construction estimated to require 10 months.

Houston, Tex.: grant of \$900,000 to city of Houston and County of Harris for construction and equipment of semi-fire proof hospital building and nurses' home; estimated cost, \$2,000,000; construction will require 18 months.

Beaumont, Tex.: grant of \$1,141,742 to Texas State Highway Commission and Jefferson County for bridge across Neches River and Federal Highway No. 87; estimated to cost \$2,537,205 and require 18 months for construction.

Announcement was made Monday that the PWA had closed down on additional requests for projects to be financed from the \$4,000,000,000 works relief fund. The action was taken following the receipt during the past three or four days of some 2500 applications from States, counties and cities, bringing the total up to approximately 6000. At the same time officials advanced the previous deadline of Sept. 12 in order that by that date the late requests may be given adequate consideration.

The President has approved a PWA allotment of \$1,247,219 to be used for rehabilitation of the equivalent of 35.36 miles of single tracks in Detroit. To this Federal sum will be added \$348,428 by the city.

Will Celebrate Constitution Day

ON Sept. 17, the one hundred and forty-eighth anniversary of the signing of the Constitution will be observed throughout the United States. Besides sectional and local meetings of patriotic, civic and service organizations, a national congress will be held in Faneuil Hall, Boston, with nationally known speakers. These addresses will be broadcast over national radio hook-ups.

Shipments of electric industrial trucks and tractors in July, as reported by ten leading manufacturers, totaled 76, as compared with 53 in the previous month, 29 in July, 1934, and 57 in July, 1933.

PERSONALS

ELLIS J. GITTINS, for 50 years associated with the J. I. Case Co. and predecessor, J. I. Case Threshing Machine Co., has resigned as chairman of the board to retire from active business. Joining the Case company in 1885, Mr. Gittins in 1902 became sales manager and in 1915 was elected vice-president, being advanced to board chairman in 1930. He served as president of the National Association of Farm Equipment Manufacturers in 1924-'25.

JOHN W. CARPENTER, for 16 years district sales manager in the Cleveland territory for the Otis Steel Co., has been made assistant manager of sales, sheet and strip division, Republic Steel Corp., Youngstown. He is a graduate of Princeton University.

ERICH FETZ has joined the metallurgical staff as research metallurgist of the Wilbur B. Driver Co., Newark, N. J.

MIL0 W. GRAY, heretofore in charge of accident prevention and

safety education at the plant of the Duquesne Light Co., and formerly identified with the Jones & Laughlin Steel Corp., has been made safety director of the Weirton Steel Co.

CHARLES M. REESEY, advertising manager of the Cincinnati Milling Machine Co., was elected president of the Cincinnati Association of Marketers, last week. Mr. ReeseY has been an active member of the association for many years. He is a graduate in mechanical engineering of the University of Cincinnati. He became associated with the Milling Machine company in 1923 and has been promoted through various departments to his present position.

D. W. KOPPES, assistant advertising manager, Incandescent Lamp Department, General Electric Co., Cleveland, will be the principal speaker in a discussion of "The Science of Seeing," at a meeting of the Chicago Purchasing Agents' Association to be held at the Hotel Sherman, on Sept. 19.

OBITUARY

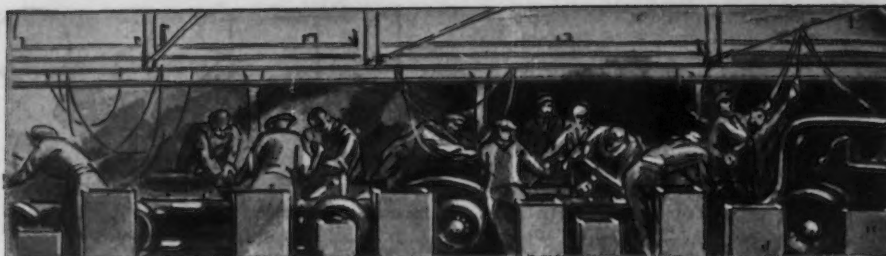
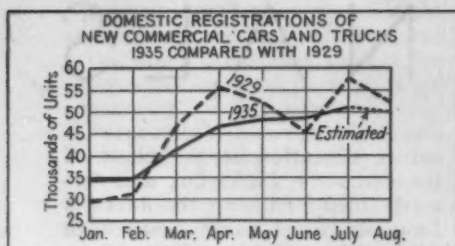
JOSEPH S. RUBLE, formerly superintendent of construction of the Austin Co., Cleveland, and vice-president of that company and later vice-president of the H. K. Ferguson Co., Cleveland engineer and contractor, died Sept. 4 at Preston Springs, Ont., age 57 years. A graduate of Penn State College in 1901, he had been employed as a construction engineer for the American Steel & Wire Co. and the Tennessee Coal, Iron & Railroad Co., and also as construction engineer for various projects in the Orient and Europe. He was a member of the American Society of Mechanical Engineers.

FRED B. SMITH, for over 25 years New England representative of the Hendey Machine Co., Torrington, Conn., died Aug. 29. He entered the employ of the company in October, 1884, as a machinist apprentice, progressing from that to journeyman machinist, later becoming a department foreman under the supervision of Henry J.

Hendey, founder of the company. Mr. Smith had the honor of rounding out a career of 50 years in the employ of the company in October, 1934.

FREDERICK J. ARNOLD, director of purchases for the American Radiator Co., New York, and assistant to the vice-president in charge of purchases for the American Radiator & Standard Sanitary Corp., died suddenly of a heart attack at his home in Scarsdale, N. Y., on Sept. 9. He was 54 years of age and had been identified with the Radiator company for more than 30 years, having begun his career in the company's Chicago offices.

An industrial exhibit sponsored by the Salesmen's and Purchasing Agents' Association of America, Inc., will be held at Bridgeport, Conn., Oct. 24 to 26. R. T. Phipps, Bullard Co., Bridgeport, is general chairman, and L. R. Watkins, 77 Seabright Avenue, Bridgeport, is secretary of the association.



THIS WEEK ON THE

Car Makers Have Ambitious Programs As They Start 1936 Production

DETROIT, Sept. 10.

THE automobile industry continues to exude optimism as it completes preparations for a big production season ahead. It has been in the vanguard of recovery forces since early in 1933 and the coming year should retain its distinction of being the premier industry of the country. Worries which now beset car manufacturers are not concerned with the size of the retail market during 1936, but how large will be the slice they can cut for themselves.

The New York show is only eight weeks away. If manufacturers are to start the year's sales race on even terms, their dealers must have new cars to display not later than Nov. 2. There are few production "bugs" to be eliminated, largely because changes are meager. Tool and die programs have come along without a semblance of labor trouble. Operating executives realize, therefore, that if adequate stocks are not in the field at announcement time, they will be on the spot. Hence the pressure on equipment makers to deliver machinery now being built.

Chevrolet, counting on having at least 40,000 cars in dealers' hands by the end of October, is rapidly expanding work at the gear and axle and forge plants in Detroit, with current output said to be averaging 3500 units a day. The Saginaw gray iron foundry is pushing up its daily melt as it gets into the casting of 1936 parts. The sheet metal plant at Flint was down only a short time. Assemblies of the new jobs are to begin the week of Sept. 22. While operations are being wound up on 1935

models, new equipment is being installed at branch assembly plants for the coming season.

Projected schedules call for 90,000 Chevrolets in November and the same number in December. The gear and axle plant has been taking in substantial tonnages of steel and of automotive parts. Indications are that by the end of the year Chevrolet will have built the 255,000 cars for which steel and other materials recently were bought.

Ford has ambitious plans. It used to be that a model change at Dearborn meant months of delay during which competitors made the most of their opportunities. In the last two or three years, however, the Ford set-up has been made very flexible with the result that Ford need take no lessons in the quick shifting of production from one model to another. It has put itself in the position this year of switching to 1936 manufacture without any halt at Rouge, aside from the two weeks' vacation early in August.

This is excellent strategy, since competitors, accustomed to the slow turning of wheels at Dearborn in the matter of change-overs, have been wondering when Ford would suspend work. The truth is that there won't be any suspension. Production at Rouge is reported at 3500 to 4000 units a day, five days a week. It appears to be the intention of the Ford management to boost the daily volume to 6000 units as soon as possible and peg it there during the coming winter.

Offhand that may seem to be a pretty big aim to fulfill. However, in less than nine months Ford has

built the million cars which it established as its goal for 1935. With an expanding market ahead, production of 1,500,000 units next year doesn't loom as improbable.

Competition to Be Rough

Having made the biggest percentage gains in the industry during this year, the group of companies just above the lowest-price bracket is confident of further improvement the coming year. At the same time, these makers have no illusions about the competition to be encountered, which will be the toughest in their history. In fact, there will be no quarter in the sales war between companies in the field ranging from \$650 to \$1,000. The rough competition will be not only between, but within families. Chrysler may fight General Motors, but there also will be plenty of sales duels between the latter's own divisions.

Cooperation is all right in its place, but too much fraternizing is inclined to make "softies" out of the selling staffs. Dissolution of the B-O-P organization and separation of selling organizations of Buick, Olds and Pontiac have already created keen competition which will be worked up to blistering heat the coming season. This rivalry, in the end, helps the esprit de corps and brings increased business to all three.

De Soto is the problem child in the Chrysler family. It has been the weakest division for the last two years. Although its percentage gain in 1935 has been impressive, its actual volume is far below that of other Chrysler divisions. It is understood that the Chrysler management is contem-



ASSEMBLY LINE

BY BURNHAM FINNEY

Detroit Editor, *The Iron Age*

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plating putting more money and more "drive" behind De Soto. For one thing, it would take the form of a separation of De Soto and Chrysler so far as sales promotion and advertising are concerned. It is said that rumblings of dissatisfaction from De Soto dealers are partially responsible for this action.

Truck Sales Near 1929 Level

Greater strides have been made toward recovery in commercial cars and trucks than in passenger cars. Retail deliveries have surpassed those in any previous year except 1929 and actually are in hailing distance of that boom year. The sales total for the first eight months of 1935 (with August estimated by R. L. Polk & Co. at 50,000 units) is 355,306 units, as against 383,692 in the same months of 1929. To this total should be added around 35,000 trucks bought by the Federal government which do not appear in registration figures.

The truck market has been uncommonly steady with sales during each of the last five months having been within the range from 46,000 to 51,000 units. Dodge attained an all-time high in August, receiving orders for over 11,000 trucks of which 7850 units were shipped to domestic points during the month. Deliveries to Canada and to dealers overseas brought shipments in the aggregate up to over 9100 units. Reo has been awarded an order for 642 trucks at a cost of \$500,000 by the U. S. Department of Agriculture to be used in soil erosion work.

White has announced its 704 series of trucks which are the first in the industry to be completely streamlined. Count Alexis de Sakhnoffsky, famed industrial stylist, who styled both the chassis and body, makes the comment that "never before has a manufacturer spent money on a truck or bodies designed and styled from the ground up without making compromises in using previous stampings or front ends." Production

will be doubled immediately. White expects to build 15,000 to 20,000 of the new models (chassis priced at \$1,240 at the factory) during 1936.

Mola Steel Makes Gains

Few changes in the type of steel to be used in automobiles in 1936 are noted. The steel which is attracting unusual attention is the so-called Mola (molybdenum) steel developed by C. Harold Wills for the Chrysler Corp'n. All Chrysler divisions are now using it for their springs and axleshafts. Experiments, said to be highly successful, have been made in adapting it to other automotive parts, including gears. Mola steel, now being made by several steel companies on a commercial basis, also is being sold outside the Chrysler ranks. It is being specified by Packard for its coil springs and leaf springs made by the Eaton Mfg. Co. Hudson also is reported to have adopted Mola steel for its springs the coming year.

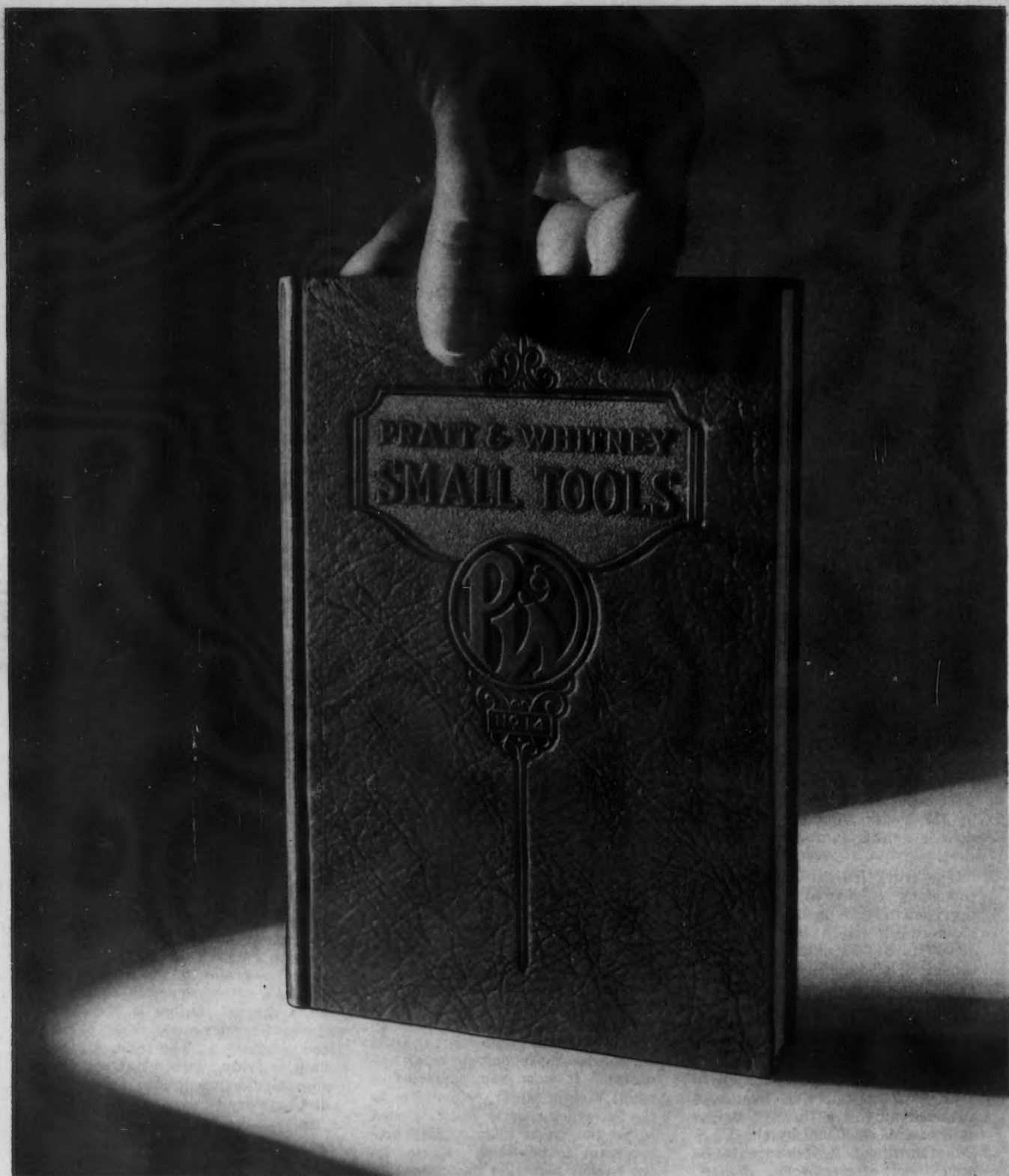
It will be recalled that Ford developed a small V-eight motor, identified as the 44 motor, two or three years ago and even went so far as to invest large sums in tools for machining it, only to scrap the design. It now has perfected a small V-eight motor, referred to as the 54, which shortly will be placed in production in France. This motor, said to be much superior to the earlier motor, is understood to be of revolutionary design and will be standard equipment in the small Matford car to be built at the Mathis plant, Ford and Mathis now having a working agreement. It is reported that several thousand of the new motors have recently been produced at the Rouge plant and shipped to France.

Interest centers in the fact that this small motor is likely to be held as "an ace in the hole" in case Ford decides the time is ripe for a

small car in this country or competition forces Dearborn's hand. There apparently is no intention of building a car with this motor in the United States, at least during the coming year. To arouse a slap-bang argument in Detroit one need only mention the possible market for a car selling for around \$100 less than the present lowest-price lines. The two questions involved are whether a car can be sold at \$350-\$400 without demoralizing the used car market and whether any company can profitably make such a car with the necessary accoutrements demanded by Americans and sell it at that price.

Pontiac yesterday began its 1936 operations, while Oldsmobile got under way a week ago. Buick will announce its new series on Sept. 28 and is working extra shifts in some departments. Packard is now turning out new models of its 120 line and its larger cars. A few of the new smaller Lincolns are said to have come off assembly lines, but volume production probably won't be achieved until next month. Cadillac's changes are understood to be limited principally to a new V-eight engine cast in one piece and to the turret top. La Salle is not expected to make much change. Dodge is the first of the Chrysler-made cars to get into production. The main Dodge plant is taking in steel at a brisk rate, fabricating it into parts for all Chrysler divisions.

Equipment buying is far less than it was, but prospects are excellent. Chevrolet still is purchasing tools for Saginaw, and Ford is active in placing some machine tool business. It is believed that many car makers during the coming months will turn their attention for the first time in several years to tool room replacement buying. Tool rooms usually are the first part of the motor plant to be neglected in the purchase of machinery and the last to be given recognition when conditions improve.



This new book, fresh from the press, will
be sent free to any executive requesting it
on his company's letterhead

PRATT & WHITNEY CO.

Hartford, Conn.

August Steel Corporation Shipments Rise to Higher Level

AUGUST steel shipments of the United States Steel Corp. rose to 624,497 tons from 547,794 tons in July. In August last year the Corporation's shipments totaled only 378,023 tons.

The August movement was sufficient to engage the company's finished steel-making capacity at 37.3 per cent of capacity for the 27 working days of the month, compared with 34.0 per cent last month.

MONTHLY SHIPMENTS OF STEEL PRODUCTS BY UNITED STATES STEEL CORPN.

Month	1933			1934			1935		
	Shipments	Per Cent of Capacity	Shipments	Per Cent of Capacity	Shipments	Per Cent of Capacity	Shipments	Per Cent of Capacity	Shipments
January	1,104,168	800,081	426,271	285,137	17.7	331,777	19.8	534,065	31.9
February	1,141,912	762,522	413,001	275,929	18.5	385,500	26.3	583,137	35.2
March	1,240,171	907,251	388,579	256,793	15.3	588,209	36.6	668,066	41.5
April	1,188,456	878,558	395,091	335,321	21.6	643,009	41.5	591,728	36.7
May	1,203,916	764,178	338,202	455,302	27.1	745,063	44.4	598,915	35.9
June	984,739	653,104	324,746	603,937	37.4	985,337	61.2	578,108	36.7
July	946,745	598,900	272,448	701,322	45.1	369,933	23.0	547,794	34.0
August	947,402	573,372	291,688	668,155	39.8	378,023	23.1	624,497	37.3
September	867,282	486,928	316,019	575,161	35.6	370,306	23.0	.....	.....
October	784,648	476,082	310,007	572,897	35.5	343,962	20.6	.....	.....
November	676,016	435,697	275,594	430,358	26.7	366,119	22.9	.....	.....
December	579,098	351,211	227,576	600,639	38.7	418,630	26.1	.....	.....
Plus or minus yearly adjustment	(40,259)	(6,040)	(5,160)	(44,283)	...	(19,907)	...	.....	.....
Total for year	11,624,294	7,676,744	3,974,062	5,805,235	30.1	5,905,966	30.6	.....	.....

Reinforcing Steel

Awards 3510 Tons—New Projects
42,955 Tons

AWARDS

Cambridge, Mass., 100 tons, automobile company unit, to Concrete Steel Co.

Newark, N. J., 115 tons, highway, to Stulz-Sickles Co., Newark.

New York, 105 tons, Henry Hudson Parkway bridges, to Concrete Steel Co.

Blodgett, Ill., 115 tons, bridge, to Concrete Steel Co.

Chicago Heights, Ill., 175 tons, sewage plant, to Calumet Steel Co.

Dubuque, Iowa, 700 tons, dam No. 11, to Inland Steel Co.

Los Angeles, 1818 tons, Specification No. 44,054, 1553 tons to Blue Diamond Corp., 256 tons to Los Angeles Iron & Steel Co.

San Francisco, 380 tons, administration building and plaza on Trans-Bay bridge, to Truscon Steel Co.

NEW REINFORCING BAR PROJECTS

Brookline, Mass., 400 tons, underpass.

St. Albans, Vt., 125 tons, post office.

State of New York, 2000 tons, highways and bridges; bids Sept. 4, 17, 24 and Oct. 1.

Brooklyn, 125 tons, college buildings; E. Walters & Co., low on general contract.

Staten Island, N. Y., 750 tons, Rapid Transit Co. bridges; bids Sept. 20.

Tarrytown, N. Y., 350 tons, Chevrolet building; bids Sept. 10.

State of New Jersey, 300 tons, mesh for highway; S. J. Groves, Ridgefield, N. J., low on general contract.

Oak Park, Ill., 140 tons, Goldberg store; plans being revised.

Chicago, 170 tons, Powers store; McCarthy Brothers, general contractors.

Benton Harbor, Mich., 350 tons, bridge; Wisconsin Bridge Co., low bidder on general contract.

Cook County, Ill., 400 tons, paving.

Chicago, 107 tons, warehouse for Greenbaum Tanning Co.

Lake County, Ill., 200 tons, bridge; B. & W. Construction Co., low bidder on general contract.

Chicago, 714 tons, Sanitary District project No. 4; Leo Michuda & Sons, general contractors.

State of Wisconsin, 525 tons, five bridges and overhead; bids Sept. 24.

Fort Smith, Ark., 145 tons, post office; Upchurch Construction Co., Montgomery, Ala., low bidder on general contract.

Vicksburg, Miss., 500 tons, post office; R. P. Farnsworth, New Orleans, low bidder on general contract.

St. Louis, 1800 tons, post office; Great Lakes Construction Co., Chicago, general contractor.

St. Louis, 100 tons, mail handling equipment for post office; Alvey Ferguson, Inc., Cincinnati, general contractor.

State of Wyoming, 100 tons, bridges in four counties; bids Sept. 12.

State of Colorado, 239 tons, bridges in six counties; bids Sept. 17.

Los Angeles, 326 tons, Metropolitan Water District, Specification 13648; call for bids canceled and will be readvertised.

Los Angeles, 250 tons, Jefferson high school; general contract awarded.

Los Angeles, Specification 109, bids Sept. 13, schedule 14, 7740 tons cut and bent; schedule 16, 10,520 tons fabricated into hoops, option on 15,660 tons additional fabricated hoops.

Navy Ships to Take 40,000 Tons of Steel

WASHINGTON, Sept. 10.—Approximately 40,000 tons of steel plates, shapes and bars will be required for the 23 naval vessels for which awards and allocations were made yesterday. The plate requirements are estimated at 24,460 tons; shapes at 11,630 tons and bars at 3910 tons. Twelve of the ships are to be built in private yards. Eleven will be constructed in Navy Yards. Award of one light cruiser was withheld. Bids for this vessel will be readvertised.

The vessels to be built in private yards are one aircraft carrier, eight destroyers and three submarines. The 11 vessels allocated to Navy Yards are three submarines, seven destroyers and one light cruiser. Awards to private yards follow:

Bethlehem Shipbuilding Corp., Quincy, Mass., one aircraft carrier; Bath Iron Works Corp., Bath, Me., three destroyers; Bethlehem Shipbuilding Corp., San Francisco, Cal., two destroyers; Federal Shipbuilding & Dry Dock Co., Kearney, N. J., three destroyers; Electric Boat Co., Groton, Conn., three submarines.

Allocations to Navy Yards were: New York, one light cruiser; Portsmouth, N. H., two submarines; Mare Island, Calif., one submarine; Norfolk, Va., and Boston, two destroyers each; Puget Sound, Wash., Charleston, S. C., and Philadelphia, Pa., one destroyer each.

The aircraft carrier will require 15,000 tons of heavy material made up of 9000 tons of plates, 4500 tons of shapes and 1500 tons of bars. The 15 destroyers will require 13,500 tons, consisting of 8100 tons of plates, 4050 tons of shapes and 1350 tons of bars. Requirements for the six submarines will aggregate 4500 tons, consisting of 3160 tons of plates, 980 tons of shapes and 360 tons of bars. The light cruiser will take a total of 7000 tons, consisting of 4200 tons of plates, 2100 tons of shapes and 700 tons of bars.

Capital Goods Index

IN observance of the holiday last week, the automobile industry reduced its production to the lowest level of the year.* This, it is estimated, lowered THE IRON AGE index of capital goods activity; but not to a large extent as unexpected gains were recorded by other components of the index. On an adjusted basis, the steel ingot production reached a new peak for the year at 63.4. At the same time the volume of heavy construction work undertaken during the week rose sub-

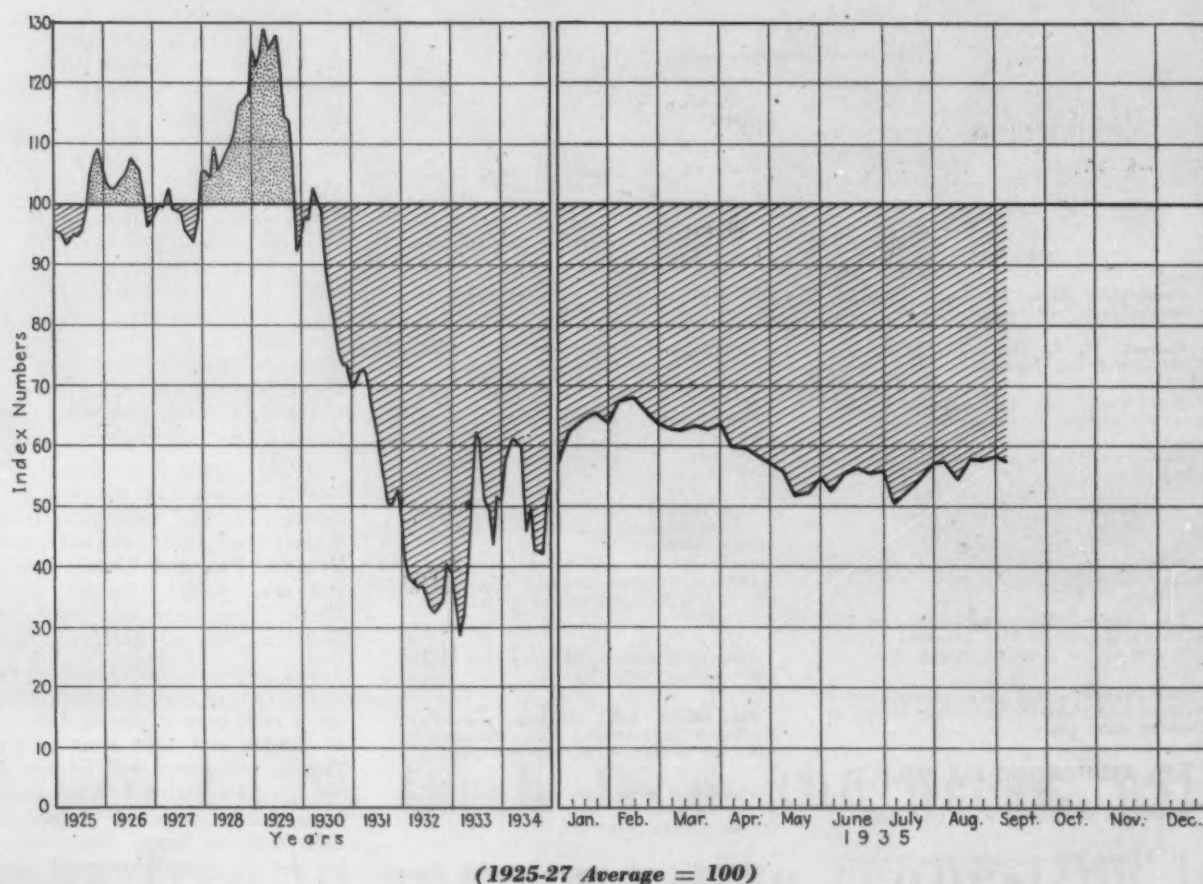
*Estimate by Cram's Reports, Inc.

The Iron Age Weekly Index Numbers of Capital Goods Activity

(1925-'27 = 100)

Last week (est.)	57.4
Preceding week (rev.)	58.1
Same week last month	57.6
Same week 1934	43.5
Same week 1933	53.8
Same week 1932	31.6
Same week 1931	55.3
Same week 1930	81.2
Same week 1929	114.1

stantially. While the figures for lumber shipments and industrial activity in the Pittsburgh area are necessarily estimated, it is believed that these indices suffered very little loss with the result that the impressive showings made two weeks ago will be maintained. Pittsburgh activity at that time was only fractionally below the February high for the year, being largely bolstered by unusually heavy coal loadings. The lumber component was higher than at any other time of the year, not only



The Iron Age Index of Capital Goods Activity. The years 1925 to 1934 are plotted by months, the current year by weeks.

In Strong Position

seasonally but in actual quantity of shipments moved.

At its present estimated level of 57.4, the capital goods index stands higher than during any other like period since 1930, being 32 per cent above 1934 and 4 per cent above 1931.

Sharp Drop in Failures

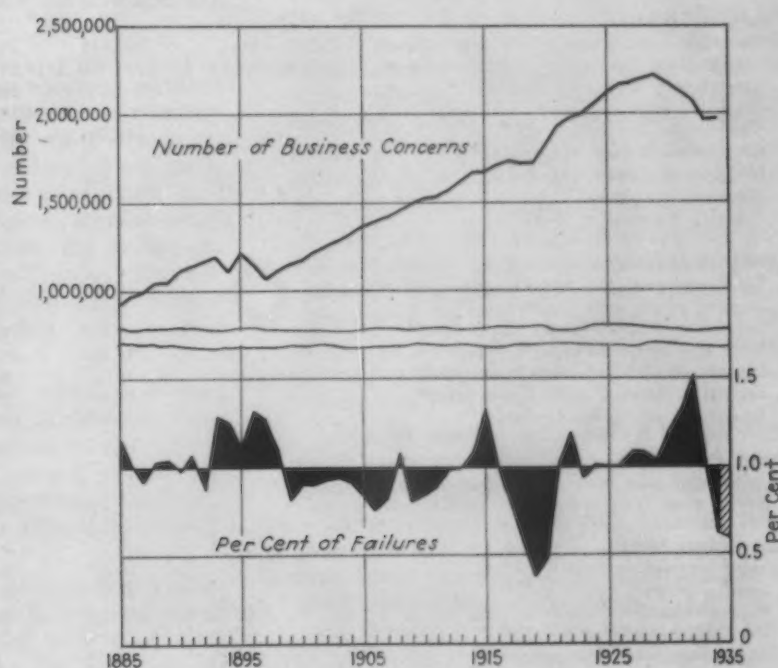
One of the encouraging indications of returning prosperity for the capital goods industries is the abrupt decline in the number of business failures during the past two years and the recent upturn in the number of concerns in business in the United States. The chart at the bottom of the page presents a fifty-year record of the number of business concerns and the percentage of the total number failing each year. Since a study of these records showed that the average annual rate of failure during the entire period was about 1 per cent of the total number of concerns in business, the areas above and below the horizontal line have been shaded to show the extent by which the number of failures each year exceeded or fell below this "normal" rate of business mortality. The severe and prolonged depression of the nineties and the two depressions occurring before and after the World War were marked by a sharp rise in business mortality, but at no time during the past half century did the commercial failure rate approach the record of 1932 when 31,822 firms, or 1.53 per cent of the total number, failed. Marked improvement occurred in 1933, however, when the number of failures dropped almost to normal,

*IRON AGE estimate based on showing of first six months.

while 1934 witnessed a further decline in the rate of failures to 0.62 per cent of the total number of concerns, which was a lower ratio than at any time during the past half century, except for three years of war and post-war prosperity. Estimates based on the first half of 1935 indicate a further drop to 0.59* per cent of the number of concerns in business.

Even more significant from the standpoint of the capital equipment market is the fact that after a steady decline from 1929 to 1933 the total number of concerns in business increased slightly in 1934 and will probably show a further gain in 1935. The reduction of 252,000 in the number of active business concerns during the four years following 1929 is further evi-

dence of the severity of the current depression. Prior to this recent decline the steady annual increase in the number of business concerns had been interrupted by declines in only four years out of the entire period—in 1894, 1896, 1897 and again in 1918. Thus the current depression has been marked not only by an abnormal number of commercial failures but also by voluntary dissolutions and consolidations of existing concerns considerably in excess of the number of new entries into business. As a result there were in 1933 only 1,960,700 concerns in business, which was a smaller number than at any time since 1921. Last year, in spite of 12,185 failures, there was a net increase of 13,200 in the number of concerns in business.



Business Failures and Number of Business Concerns

Source: Dun & Bradstreet.

Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources
and Are Changed Regularly as More Recent Figures Are Made Available

	August, 1935	July, 1935	August, 1934	Eight Months, 1934	Eight Months, 1935
Raw Materials:					
Lake ore consumption (gross tons) ^a		2,198,189	1,443,943	16,766,927	.....
Coke production (net tons) ^b		2,612,411	2,323,100	22,344,300	.....
Pig Iron:					
Pig iron output—monthly (gross tons) ^c	1,761,286	1,520,263	1,054,382	12,077,521	13,080,549
Pig iron output—daily (gross tons) ^c	56,816	49,041	34,012	49,702	53,829
Castings:					
Malleable castings—production (net tons) ^d		28,915	23,910	261,339	.....
Malleable castings—orders (net tons) ^d		25,526	21,306	250,815	.....
Steel castings—production (net tons) ^d			43,748	339,401	.....
Steel castings—orders (net tons) ^d			25,538	340,903	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons) ^e ..	2,919,326	2,270,224	1,381,350	19,273,357	21,214,241
Steel ingot production—daily (gross tons) ^e	108,123	87,316	51,161	92,660	101,992
Steel ingot production—per cent of capacity ^e ..	48.84	39.44	23.24	42.08	46.07
Employment in Steel Industry:					
Total employees ^g		414,937	404,793	422,615	.....
Total payrolls (thousands of dollars) ^g		\$42,725	\$34,362	\$327,676	.....
Average hours worked per week ^g		31.5	26.5	32.1	.....
Finished Steel:					
Trackwork shipments (net tons) ^h		4,054	5,364	39,237	.....
Sheet steel sales (net tons) ⁱ		206,313	66,064	1,324,225	.....
Sheet steel production (net tons) ^j		145,505	77,197	1,411,714	.....
Fabricated shape orders (net tons) ^k		57,556	95,489	765,934	.....
Fabricated shape shipments (net tons) ^k		94,733	122,482	668,091	.....
Fabricated plate orders (net tons) ^k			16,293	167,649	.....
Reinforcing bar awards (net tons) ^k	101,140	7,645	27,315	150,730	221,540
U. S. Steel Corpn. shipments (tons) ^h	624,497	547,794	378,023	4,426,856	4,726,290
Ohio River steel shipments (net tons) ^l		77,464	45,840	442,277	.....
Fabricated Products:					
Automobile production, U. S. and Canada ^m		390,118	244,715	2,317,109	.....
Construction contracts, 37 Eastern States ⁿ	\$168,557,200	\$159,249,900	\$119,591,800	\$1,093,356,000	\$1,024,313,900
Steel barrel shipments (number) ^d			364,081	4,798,839	.....
Steel furniture shipments (dollars) ^d			1,101,469	8,801,619	.....
Steel boiler orders (sq. ft.) ^d		519,061	565,843	2,858,961	.....
Locomotive orders (number) ^m	0	5	5	88	21
Freight car orders (number) ^m	100	500	113	22,996	7,183
Machine tool index ^o		119.8	41.4	†37.1	.....
Foundry equipment index ^o		93.3	43.1	†54.7	.....
Foreign Trade:					
Total iron and steel imports (gross tons) ^p		31,894	32,418	217,732	.....
Imports of pig iron (gross tons) ^p		5,519	18,418	86,801	.....
Imports of all rolled steel (gross tons) ^p		18,719	10,910	77,790	.....
Total iron and steel exports (gross tons) ^p		296,802	242,947	1,729,307	.....
Exports of all rolled steel (gross tons) ^p		83,171	81,928	651,320	.....
Exports of finished steel (gross tons) ^p		68,129	71,779	565,531	.....
Exports of scrap (gross tons) ^p		205,779	1,025	29,160	.....
British Production:					
British pig iron production (gross tons) ^r		547,300	503,300	3,930,000	.....
British steel ingot production (gross tons) ^r		803,300	667,000	5,892,500	.....
Non-Ferrous Metals:					
Lead production (net tons) ^s		34,424	27,328	272,906	.....
Lead shipments (net tons) ^s		34,575	33,606	241,529	.....
Zinc production (net tons) ^t	35,922	35,055	26,169	234,933	280,964
Zinc shipments (net tons) ^t	39,200	32,241	21,663	238,525	286,524
Deliveries of tin (gross tons) ^v	5,320	5,290	4,045	30,065	39,000

*Preliminary. †Three Months' Average.
Source of figures: ^aLake Superior Iron Ore Association; ^bBureau of Mines; ^cTHE IRON AGE; ^dBureau of the Census; ^eAmerican Iron and Steel Institute; ^fNational Association of Flat-Rolled Steel Manufacturers; ^gAmerican Institute of Steel Construction; ^hUnited States Steel Corpn.; ⁱUnited States Engineer, Pittsburgh; ^jWhen preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; ^kF. W. Dodge Corpn.; ^lRailway Age; ^mNational Machine Tool Builders Association; ⁿFoundry Equipment Manufacturers Association; ^oDepartment of Commerce; ^pBritish Iron and Steel Federation; ^qAmerican Bureau of Metal Statistics; ^rAmerican Zinc Institute, Inc.; ^sNew York Commodities Exchange.

SUMMARY OF THIS WEEK'S BUSINESS

Ingot Output Rises Two Points to 52½ Per Cent of Capacity

Post-Holiday Recovery Is Sharp—Future Course of Operations Depends Mainly
On Automotive Demand—New Bar Card Revised—Scrap Index Rises

STEEL ingot production has risen two points to 52½ per cent, the highest rate since the second week in February. Gains have been widespread, with operations rising one point to 45 per cent at Pittsburgh, three points to 60 per cent at Chicago, three points to 80 per cent in the Wheeling district, six points to 38 per cent at Buffalo, nine points to 64 per cent in the Cleveland-Lorain area, 10 points to 70 per cent in the Ohio River district, and one point to 39 per cent in the Philadelphia zone. Elsewhere output is substantially unchanged, with Detroit holding at the high rate of 95 per cent and the Valleys at 60 per cent.

Scrap, after a period of hesitancy, has resumed its upward trend, an advance in heavy melting steel at Philadelphia lifting THE IRON AGE composite from \$12.58 to \$12.75 a ton, its highest level since the second week of March, 1934.

THE gain in steel production has occurred without much added support from the automotive industry. Though parts makers are ordering steel somewhat more freely, expected round-lot orders from automobile manufacturers for new model production have not materialized. However, producers of flat-rolled steel look for generous releases from the motor car trade within the next two or three weeks. The volume of this business, when it appears, will largely determine the extent of any further rise in steel works operations.

Miscellaneous demand for steel, which has been surprisingly large in the aggregate, is showing signs of leveling off. Tin plate production is entering a period of seasonal recession. Railroad buying remains at depression levels. Construction, though still far below the average volume of the 20's, is improving.

AWARDS of construction steel as reported to date by THE IRON AGE, including fabricated structural steel, plate work, reinforcing and sheet steel piling, have finally forged ahead of lettings for 1934, the total for this year being 859,500 tons as against 855,500 tons for the corresponding period a year ago. Included in this year's total is 83,790 tons of reinforcing steel for the Los Angeles water district, mill orders for which have now been completely allocated subject to Federal approval.

Structural steel awards for the week, at 25,650

tons, are the largest since the third week in April. Bookings of sheet steel piling total 7500 tons.

Navy awards of 23 vessels to private and Government yards will mean the placing of 40,000 tons of plates, shapes and bars.

The New York Central has closed for 7400 tons of rails, and the Pere Marquette, buying for its Canadian lines, has ordered 1700 tons of rails and 450 tons of tie plates from the Algoma mill.

FOURTH quarter contracting for finished steel has been light, most quotations outstanding for that period being against contractors' bids. Anticipatory buying of products on which new price cards have been announced has likewise been in comparatively small volume, though a spurt in such purchasing is looked for before Oct. 1. Business of this type has been most active in the case of forging billets. Orders for galvanized sheets from jobbers, who will lose their \$2 a ton discount next quarter, also have been on an ascending scale. Galvanized sheet output is now virtually at capacity, while total sheet production has risen 10 points to 70 per cent of capacity, recovering the ground lost because of the Labor Day holiday.

The new card of quantity extras and deductions for hot-rolled bars, announced last week, has been revised. The base price now covers quantities of 5 tons up to 25 tons, instead of 10 to 25 tons. The extra for 5 to 10 tons has been eliminated and the extra for 3 to 5 tons has been reduced to 5c. per 100 lb.

Fourth quarter contracting for pig iron has gotten away to a good start in Cleveland, Chicago and Cincinnati. Shipments are running well ahead of August.

Appointment of the new national labor board has been followed by prompt action on the part of organized labor in reviving charges against a number of steel and automotive plants. An NRA bulletin—spell breathers take note—sets forth the possibilities of restoring Governmental regimentation of industry without running counter to the Constitution.

Steel ingot production in August, at 48.84 per cent, was only slightly higher than the average of THE IRON AGE weekly estimates, which was 48.78 per cent.

THE IRON AGE composite prices for finished steel and pig iron are unchanged at 2.124c. a lb. and \$17.84 a gross ton respectively.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous;
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:	Sept. 10, 1935	Sept. 4, 1935	Aug. 13, 1935	Sept. 11, 1934
No. 2 fdy., Philadelphia	\$20.3132	\$20.3132	\$20.3132	\$20.26
No. 2, Valley furnace	18.50	18.50	18.50	18.50
No. 2 Southern, Cin'tl.	19.2007	19.2007	19.2007	19.13
No. 2, Elrmingham†	14.50	14.50	14.50	14.50
No. 2 foundry, Chicago*	18.50	18.50	18.50	18.50
Basic, del'd eastern Pa.	19.8132	19.8132	19.8132	19.76
Basic, Valley furnace	18.00	18.00	18.00	18.00
Malleable, Chicago*	18.50	18.50	18.50	18.50
Malleable, Valley	18.50	18.50	18.50	18.50
L. S. Charcoal, Chicago	24.2528	24.2528	24.2528	24.04
Ferromanganese, sea'b car-lots	85.00	85.00	85.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivery quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Finished Steel

Per Lb.:	Sept. 10, 1935	Sept. 4, 1935	Aug. 13, 1935	Sept. 11, 1934
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.40
Hot-rolled annealed sheets, No. 24, Gary	2.50	2.50	2.50	2.50
Sheets, galv., No. 24, P'gh	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, Gary	3.20	3.20	3.20	3.20
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.85
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.95
Wire nails, Pittsburgh	2.40	2.40	2.60	2.60
Wire nails, Chicago dist. mill	2.45	2.45	2.65	2.65
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.35
Barbed wire, galv., Pittsburgh	2.80	2.80	3.00	3.00
Barbed wire, galv., Chicago dist. mill	2.85	2.85	3.05	3.05
Tin plate, 100 lb. box, P'gh	\$5.25	\$5.25	\$5.25	\$5.25

Scrap

Per Gross Ton:	Sept. 10, 1935	Sept. 4, 1935	Aug. 13, 1935	Sept. 11, 1934
Heavy melting steel, P'gh	\$13.25	\$13.25	\$13.00	\$10.75
Heavy melting steel, Phila.	12.50	12.00	11.00	9.75
Heavy melting steel, Ch'go	12.50	12.50	12.25	8.50
Carwheels, Chicago	12.75	12.75	12.75	9.50
Carwheels, Philadelphia	11.75	11.75	11.25	11.25
No. 1 cast, Pittsburgh	14.25	14.25	13.50	11.75
No. 1 cast, Philadelphia	11.75	11.75	11.25	11.75
No. 1 cast, Ch'go (net ton)	11.25	11.00	11.00	8.00
No. 1 RR. wrot., Phila.	12.25	12.25	10.25	11.25
No. 1 RR. wrot., Ch'go (net)	9.50	9.50	9.50	6.75

Coke, Connellsville

Per Net Ton at Oven:	Sept. 10, 1935	Sept. 4, 1935	Aug. 13, 1935	Sept. 11, 1934
Furnace coke, prompt	\$3.25	\$3.25	\$3.25	\$3.85
Foundry coke, prompt	4.00	4.00	4.00	4.60

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery	8.25	8.25	7.75	8.75
Lake copper, New York	8.62½	8.62½	8.12½	9.12½
Tin (Straits), New York	48.25	48.62½	49.62½	51.37½
Zinc, East St. Louis	4.60	4.60	4.50	4.15
Zinc, New York	4.97½	4.97½	4.87½	4.50
Lead, St. Louis	4.20	4.20	4.05	3.55
Lead, New York	4.35	4.35	4.20	3.70
Antimony (Asiatic), N. Y.	13.00	13.00	13.00	8.62½

Rails, Billets, etc.

Per Gross Ton:	Sept. 10, 1935	Sept. 4, 1935	Aug. 13, 1935	Sept. 11, 1934
Rails, heavy, at mill	\$36.37½	\$36.37½	\$36.37½	\$36.37½
Light rails, Pittsburgh	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh	27.00	27.00	27.00	27.00
Sheet bars, Pittsburgh	28.00	28.00	28.00	28.00
Slabs, Pittsburgh	27.00	27.00	27.00	27.00
Forging billets, Pittsburgh	35.00	35.00	32.00	32.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00
Skelp, gvr'd. steel, P'gh, lb.	1.70	1.70	1.70	1.70

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.80	1.80	1.80	1.80
Bars, Chicago	1.85	1.85	1.85	1.85
Bars, Cleveland	1.85	1.85	1.85	1.85
Bars, New York	2.15	2.15	2.15	2.13
Plates, Pittsburgh	1.80	1.80	1.80	1.80
Plates, Chicago	1.85	1.85	1.85	1.85
Plates, New York	2.09	2.09	2.09	2.08
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.80
Structural shapes, Chicago	1.85	1.85	1.85	1.85
Structural shapes, New York	2.06¼	2.06¼	2.06¼	2.05¼
Cold-finished bars, Pittsburgh	1.95	1.95	1.95	2.10
Hot-rolled strips, Pittsburgh	1.85	1.85	1.85	1.85
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.60

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products as shown in our detailed price tables.

The Iron Age Composite Prices

Finished Steel

Sept. 10, 1935	2.124c. a Lb.
One week ago	2.124c.
One month ago	2.124c.
One year ago	2.124c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.

Pig Iron

\$17.84 a Gross Ton
17.84
17.84
17.90

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap

\$12.75 a Gross Ton
12.58
12.08
9.67

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	Low	HIGH	Low	HIGH	Low
1935	2.124c., Jan. 3	2.124c., Jan. 8	\$17.90, Jan. 8	\$17.83, May 14	\$12.75, Sept. 10	\$10.33, April 23
1934	2.199c., April 24	2.008c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., April 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.03, Nov. 22

Production in Further Rise In Tri-State Area



**Pittsburgh Rate Reaches 45 Per Cent
and Wheeling District Average Ad-
vances to 80 Per Cent—Bar Card
Again Revised**

PITTSBURGH, Sept. 10.—Raw steel production in the Pittsburgh district has crept forward one point this week to 45 per cent, equaling the previous high rate for the year in the week of Feb. 4. Moderately higher schedules of the leading producer and sustained operations at most independent mills in this district have accounted for the slight increase.

Sheet mills recovered holiday losses of 10 points and are operating at 70 per cent, but sporadic gains in tin plate output are too small to offset declines in other directions and tin plate production is barely holding at 55 per cent. Hot and cold-rolled strip production has forged ahead five points to about 45 per cent of capacity. Wire mill output at some units is nearing a peak for the year with average production in this district estimated at around 50 per cent.

Ingot output in the Valleys and nearby northern Ohio mills is holding steadily at 60 per cent. Production in the Wheeling district is three points higher at 80 per cent.

No important changes in the character of finished steel demand have appeared. Anticipatory buying has not made much headway, although a spurt in such buying is believed in the making for later this month. The surface of fourth quarter requirements has barely been scratched, and quotations outstanding for that period are largely against contractors' bids.

Revisions have been made in the new card of quantity extras and deductions on hot-rolled carbon bars announced last week. The changes provide for the broadening of the base bracket to under 25 tons to 5 tons, thus eliminating the extra bracket—under 10 tons to 5 tons. The first extra bracket now covering under 5 tons to 3 tons, which was 7½¢ a 100 lb., has been changed to 5¢ a 100 lb. The base price at Pittsburgh will be 1.85¢ a lb. as covered in the original changes. The new card covering these changes will apply to

fourth quarter shipments excepting for the quantity deductions by which large consumers may benefit immediately.

Pig Iron

Small-lot buying shows an occasional spurt, but the aggregate volume of bookings has not expanded measurably. The opening of books for fourth quarter at unchanged prices has not brought out much tonnage, and spot buying continues to be the general rule. Jobbing foundry melt is spotty in this district, while heating equipment foundry units are faring better. Requirements of ingot mold makers are only fair. While prospects of higher fuel costs under the Guffey bill remain the moot point in discussions of pig iron prices, the outstanding check to an early advance in quotations is the wide spread that still exists between virgin metal and scrap material.

Semi-Finished Steel

Demand for finished steel has increased in the past week, excepting in the case of sheet bars for tin plate conversion. Shipments of skelp to non-integrated pipe mills are notably heavy. Some stocking of forging billets is in evidence. Demand for wire rods is well sustained. Carbon billets and slabs are relatively quiet.

Reinforcing Steel

The American Oil Co. has awarded general contract for a bulk storage station at Hays, Pa., to P-K Construction Co., Pittsburgh, which is expected to place about 100 tons of reinforcing bars for the project this week. The new bending extras that recently became applicable in some districts are now becoming more generally recognized. Although on some large tonnages the base price has been subject to concession, the market on the average run of business has assumed a semblance of

stability. It is now considered questionable whether any further changes in the quotational setup on reinforcing steel to reflect the revisions in the hot-rolled bar card are in the immediate offing.

Bolts, Nuts and Rivets

Discounts for fourth quarter probably will be announced late this week. There is some doubt as to whether current prices generally will be reaffirmed for next quarter, since irregularities in some districts have become pronounced within the past few months. Meanwhile demand is only fair, with minor increases in shipments reported for the past week.

Bars

Adoption of the new list of quantity extras and deductions and a \$1 increase in the base price initiated by Carnegie Steel Co. has become general. Thus far, the prospective changes on Oct. 1 have not measurably affected incoming tonnage, which remains on a par with that in August. Large purchasers are reported to be surveying their forward requirements, and it is believed that heavier average orders from major bar consumers will be forthcoming soon. On the other hand, small buyers who will be faced with higher quantity and size extras next month have not been quick to anticipate their needs. Demand continues to be well diversified.

Tubular Products

Demand is a shade lighter, while shipments are holding the recent steady pace. The widely discussed natural gas line from the terminal of the Panhandle Eastern Pipe Line Co. at Dana, Ind., to Detroit, again is gaining prominence in the pipe line market. Steel pipe requirements for the project are estimated at 60,000 tons. No change is evident in the movement of oil country goods. Other tubular items also are featureless. On inquiries for fourth quarter, current discounts are being figured.

Wire Products

While demand continues to be well diversified, a steady inflow of orders from the manufacturing trade remains the backbone of this market. Merchant items are showing up less impressively than manufacturers' wire, but total combined tonnage being booked in this district is sufficient to maintain operations at 45 to 50 per cent of capacity. Little stocking in cases where the new price schedules will

result in advances for fourth quarter is reported.

Strip Steel

This market continues moderately active, with bookings and shipments on a parity with those in the past several weeks. Practically all orders are for prompt delivery and represent a wide variety of consumer demand. Automobile buying for new model construction has not yet assumed definite importance, and the current rate of activity points toward a substantial increase when such buying is resumed in a large way. Prices on hot and cold-rolled strip are well maintained, and in the absence of any prospective changes for fourth quarter there is little pressure on the part of buyers to cover ahead.

Cold-Finished Bars

The present base price of 1.95c., Pittsburgh, on cold-finished carbon steel bars has been reaffirmed for fourth quarter delivery, with the new list of extras announced two weeks ago to become generally effective on Oct. 1. A general broadening in demand is reported by some producers. Jobbers are purchasing fairly steadily, indicating that some stocking is under way in anticipation of the new extras to be in force next quarter.

Sheets

An unbroken flow of diversified orders in the past week has placed sheet makers in position to regain the ground lost in operations last week, and output in the current period will rebound 10 points to about 70 per cent of capacity. Little change is discernible in the trend of demand, excepting possibly an increasing tendency in automotive tonnage. Galvanized roofing is in strong demand, evidently due partly to the removal of

the \$2 a ton jobber allowance on Oct. 1.

Tin Plate

Sporadic increases in hot-rolling schedules this week are not expected to be sufficient to overcome much of the holiday losses last week, and production for the industry in the current period probably will run between 55 and 60 per cent. Releases are appearing slowly, and producers are not sanguine of any improvement for some months. It is estimated that 90 per cent of the tin plate requirements for this year's vegetable pack has already been rolled, and for the remainder of the year producers will place chief reliance upon general line can business and anticipatory rolling against next year's contracts when the base tin plate price for 1936 is announced this fall.

Plates and Shapes

Plate producers in this district are working on small backlogs, and new tonnage reaching this district in the past week added little to present rolling schedules. The structural market offers little cheer, with fresh specifications and awards in meager volume. Small private construction projects are more numerous.

While all producers are maintaining the base price of 1.80c., Pittsburgh, for plates and shapes, competition on fabricated shapes continues to be keen.

Coal and Coke

Shipments of domestic coal and coke are increasing seasonally. Connellsville domestic coke prices have moved 10c. to 20c. a ton higher, with stove and egg quotable at \$3.60, and nut at \$3.25 to \$3.35, ovens. Domestic coal prices are unchanged, with lump ranging \$2 to \$2.25, mines. No principal

developments have occurred in the industrial fuel markets, with prices remaining unchanged in the face of wage discussions and other matters relating to the Guffey bill.

Scrap

This market is marking time. Bidding this week on railroad lists probably will reveal the drift of prices, which for the past week have remained firm and unchanged. A small tonnage of No. 1 heavy melting steel on the Baltimore & Ohio list is reported to have been purchased by a dealer at higher than \$14.50, delivered Pittsburgh district. Ordinary No. 1 heavy melting steel is moving to two designations in this district on \$13.50 orders, against which dealers are paying \$13 to \$13.25 to cover. A small lot of compressed sheet steel has been sold at higher than the general market for the grade.

Railroad Equipment

Montreal Harbor Commission, Montreal, Canada, has ordered three switching locomotives from Montreal Locomotive Works, Ltd.

Pennsylvania Railroad has placed an order with Timken Roller Bearing Co., Canton, Ohio, for bearings and boxes to equip engine and trailer trucks of eight existing class K-4-s passenger locomotives.

RAILS AND TRACK SUPPLIES

Pere Marquette has placed 1700 tons of rails and 450 tons of tie plates with Algoma Steel Corp.

Weir to Address Advertising Men

E. T. WEIR, chairman, National Steel Corp., Pittsburgh, will deliver the principal address at the annual conference of the National Industrial Advertisers Association at the Hotel William Penn, Pittsburgh, Sept. 18.

Weekly Indications of Steel Activity

From THE IRON AGE

	Sept. 10, 1935	Sept. 4, 1935	Aug. 13, 1935	Sept. 11, 1934	Average Year to Date	
					1935	1934
Steel ingot operations—Per cent of capacity	52.5	50.5	49.0	19.5	45.9	41.0
	Week Ended				Year to Date	
	Sept. 10, 1935	Sept. 4, 1935	Aug. 13, 1935	Sept. 11, 1934	1935	1934
Fabricated structural steel awards.....	25,650	8,825	15,920	8,900	489,155	566,920
Fabricated plate awards.....	1,210	12,200	160	1,500	101,232	93,637
Sheet steel piling awards.....	7,500	2,550	2,900	205	44,115	42,640
Reinforcing bar awards.....	3,510	87,550	1,475	1,575	225,050	152,305

Chicago Output Rebounds To 60 Per Cent of Capacity



Steel Commitments for Fourth Quarter, However, Are Disappointing—
Pig Iron Contracting Under Way

CHICAGO, Sept. 10. — All ground lost in ingot output has been regained and production now stands at 60 per cent of capacity, a gain of three points above the holiday week average. New buying is dragging, considering that fourth quarter books are open, and fresh specifications are no heavier than at the end of August. The situation gives rise to the thought among some producers that production will level off at or near the present rate. Arguments for a higher rate may be seen in increasing automobile production, in current structural awards of 20,000 tons, in a Mississippi River piling award of 1800 tons, with 8000 tons still to be placed, and in the near approach of actual construction of several large overhead crossing programs.

Although finished steel is not making a strong showing in the matter of fourth quarter business, there is no hesitancy on the part of pig iron users to make their wants known. Sales of merchant iron are active and books are larger now than at any time so far this year. Farm implement manufacturers are beginning to scan the possibilities in 1936 and at this time look for a greater volume than will be accounted for at the close of 1935.

Most of the fear of a violent corrective movement in scrap prices has passed. In fact, in the last two or three days a few factors of strength have made their appearance.

Pig Iron

Consumers are actively requesting shipments, which are 65 per cent heavier than a week ago. The indications are that this rate will not be sustained, but sellers are all convinced that the September movement will top August. New buying is on a broad scale and books are heavier than at any time in 1935. Prices remain very strong. An Erie merchant stack is being lighted and will be put into production at an early date.

Cast Iron Pipe

Chicago, after several months delay, has made formal award of

1595 tons to Glamorgan Pipe & Foundry Co. Otherwise this market remains very quiet, though carlot inquiries are moderately more numerous. The season is rapidly advancing, and sellers are anxiously looking for any hopeful sign that Government funds will soon be used on a broad scale and that business for pipe foundries will result. Prices remain steady.

Reinforcing Bars

General conditions in this market are a little brighter. In the first place prices are on a firmer base. Also, there is once again a fair flow of private inquiry. Further, the State road department seems to be coming to life in a small way after having established for this year the lowest new paving mileage in about 10 years. The market factor that is disturbing bar fabricators is that the potential tonnage seems small and they can plan shop operations only a very short period ahead. Contractors are still waiting for final awards on most of the Mississippi River work.

Wire Products

Producers are still waiting for jobbers to start a fall buying movement. Just why this has not started on a broad scale cannot be fully explained at this time. Jobbers, of course, know that prices are stable and, having fair stocks on hand, they may intend to wait for heavier consumer demand. The outlook in practically all agricultural sections is good, the exceptions being in areas where excessive rain and high winds have damaged crops. On the whole, crops have made more than satisfactory progress in the last week to ten days. Automobile plants are not yet exerting pressure for wire products. Mill output is somewhat variable and ranges from 45 to 50 per cent of capacity. Wire rod prices are still in doubt, but early announcements are expected on fourth quarter quotations.

Bars

There is steady improvement in demand from automobile builders,

whose requirements are expected to grow heavier as the month progresses. Farm implement manufacturers not only feel assured of good business for the remainder of this year, but there are those in the trade who prophesy that the 1936 volume will exceed that done in 1935. Forward buying of steel bars is dragging, but sellers expect that, as consumers get better ideas of what will be needed in the fourth quarter, commitments will begin to climb. The new price structure is counted on to bring out larger orders and to put a check on the practice of users parceling out parts of meager requirements to various mills.

Plates

This market has again fallen back into a groove wherein it is dependent for the most part on lock and dam work on the Mississippi River. Miscellaneous orders are in fair volume, but they are all small and there is as yet no verification of reports that railroad buying will get under way before the end of the year. The Chicago Surface Lines are still in doubt about the purchase of 100 new cars.

Structural Material

Awards are exceptionally heavy at 20,000 tons, being strongly bolstered by 8500 tons for additions to the Gary plant of the American Sheet & Tin Plate Co. Inquiries have dropped back to 5000 tons. Bids will be taken at St. Louis Sept. 17 on lock No. 25 which completes the Mississippi River program for which money has already been appropriated. There is other work to be done along that river, but there is no inkling as to when the money will be made available.

Rails

The New York Central has made awards of 7400 tons of rails. In all other respects this market is dull and there are no promising developments to which sellers can look forward.

Sheets

Demand is holding close to an even keel, though the character of users' needs indicates that a change is in progress. The miscellaneous trade is now less important, as larger consumers are coming into the market on a much broader scale. At the same time there is some indication that small users are on the whole using slightly smaller quantities.

Scrap

Mills have paid \$12.75 for heavy melting steel and from there on the

story becomes a mixture of dealers' ideas as to what is taking place. Most available facts point to a condition which in the last few days has tended toward giving the price structure more backbone. Such weakness as appears on the surface

is confined to steel mill grades. Five boat loads of scrap are being shipped from Duluth to a Chicago mill. Boat movements out of Chicago have not yet materialized and stocks at docks, especially of borings, are near record size.

Fabricated Structural Steel

Awards in Good Volume—New Projects Decline

STRUCTURAL steel lettings, at 25,650 tons, are the largest since the third week in April, and compare with 8825 tons a week ago. The outstanding awards are 8500 tons for the American Sheet & Tin Plate Co. at Gary, Ind., and 4200 tons for a dam in the Mississippi River at Dubuque, Iowa. New projects of 10,450 tons compare with 15,520 tons last week and 14,720 tons two weeks ago. The largest new jobs reported are a bridge at Warsaw, Mo., requiring 2000 tons, and 1200 tons for the Brooklyn College at Brooklyn, N. Y. Plate awards total 1210 tons with 3800 tons pending. Bookings of sheet piling, at 7500 tons, include 5000 tons for a levee wall at Monroe, La. Structural steel awards for the week follow:

NORTH ATLANTIC STATES

Millbury, Mass., 200 tons, bridges, to Boston Bridge Works, Inc.

Staten Island, N. Y., 770 tons, Elm Park grade elimination, to American Bridge Co.

Newark, N. J., 410 tons, subway for Pennsylvania Railroad, to American Bridge Co.

Atlantic City, N. J., 210 tons, State highway bridge, to Phoenix Bridge Co.

SOUTH AND SOUTHWEST

Petersburgh, Va., 165 tons, post office, to Bristol Steel & Iron Works.

Bessemer, Ala., 100 tons, State highway viaduct, to Nashville Bridge Co.

Sheffield, Ala., 750 tons, power house, to Wisconsin Bridge & Iron Co.

Dallas, Tex., 120 tons, airplane hangar, for Love Field, to Mississippi Valley Structural Steel Co.

CENTRAL STATES

Benton Harbor, Mich., 736 tons, highway bridge, to Wisconsin Bridge Co.

Detroit, 200 tons, Budd wheel plant, to Acorn Iron Works.

Campbell, Ohio, 330 tons, bridge for P. & L. E. Railroad, to Pittsburgh-Des Moines Steel Co.

Cleveland, 500 tons, Easterly sewage disposal plant administration building, to Fort Pitt Bridge Works Co.

Gary, Ind., 8500 tons, extensions for American Sheet & Tin Plate Co., to American Bridge Co.

Chicago, 180 tons, Fort Dearborn post office station, to McClintic-Marshall Corp.

Alton, Ill., 220 tons, machine building for Alton Box Board & Paper Co., to Mississippi Valley Structural Steel Co.

Gurnee, Ill., 200 tons, bridge, to Milwaukee Bridge Co.

New Dennison, Ill., 500 tons, bridge, to Vincennes Steel Corp.

Fort Dodge, Iowa, 485 tons, bridge, to Wisconsin Bridge & Iron Co.

Columbus, Iowa, 890 tons, State highway bridge, to Clinton Bridge Works.

Dubuque, Iowa, 4200 tons, dam No. 11, to R. C. Mahon Co.

Dubuque, Iowa, 340 tons, bridge at dam No. 11, to Worden-Allen Co.

Lacrosse, Wis., 1800 tons, dam, to McClintic-Marshall Corp.

Jamestown, N. D., 360 tons, hospital, to McClintic-Marshall Corp.

WESTERN STATES

Boulder City, Nev., 635 tons, transmission towers for Bureau of Reclamation, to American Bridge Co.

Shelby, Mont., 260 tons, bridge, to American Bridge Co.

Toole County, Mont., 255 tons, Marias River bridge, to Minneapolis-Moline Power Implement Co.

Madison County, Mont., 185 tons, Odell Creek bridge, to Great Falls Iron Works.

Denver, 370 tons, Federal mint building, to McClintic-Marshall Corp.

Denver, 710 tons, custom house extension, to McClintic-Marshall Corp.

Denver, 200 tons, roller skating rink, to Burkhardt Sons Steel & Iron Works.

Ontario, Cal., 100 tons, foundry for General Electric Co., to Pacific Coast Steel Corp.

Tacoma, Wash., 100 tons, smelter addition, to Steel Fabricators, Inc.

Los Angeles, 350 tons, tunnel ribs, Specification 121, to Commercial Shearing & Stamping Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Brookline, Mass., 300 tons, State bridge.

Readville, Mass., 200 tons, distillery warehouse.

Bristol, Conn., 100 tons, post office; Joseph Lasprogato, South Norwalk, low bidder.

Brooklyn, 1200 tons, heating and gymnasium for Brooklyn College; Waters & Co., New York, low bidder.

Brooklyn, 325 tons, Gowanus Health Center; bids Sept. 10.

New York, 200 tons, Postal Station O; bids Sept. 30.

Tarrytown, N. Y., 700 tons, plant addition for Chevrolet Motor Co.

Oneida County, N. Y., 120 tons, State highway bridge.

Central Railroad of New Jersey, 625 tons, bridge at Newark, N. J.

Pittsburgh, 375 tons, Penn Township high school building.

Erie, Pa., 200 tons, plant addition for General Electric Co.

SOUTH AND SOUTHWEST

Clarksburg, W. Va., 200 tons, bridge.

Carrizozo, N. M., 100 tons, bridge.

CENTRAL STATES

Detroit, 850 tons, factory building for American Blower Corp.

Niles, Ohio, 200 tons, building for Niles Glass Works, subsidiary of General Electric Co.

Cleveland, 100 tons, remodeling of 322 Euclid Building.

Streator, Ill., 250 tons, building for Owens-Illinois Glass Co.

Peoria, Ill., 100 tons, Hiram Walker & Sons.

Potosi, Wis., 150 tons, building.

State of Wisconsin, 385 tons, five bridges; bids Sept. 24.

St. Louis, 7500 tons, Great Lakes Construction Co., Chicago, general contractor.

St. Louis, 150 to 200 tons, shapes, 100 tons of sheets and 25 tons of cold drawn shafting for mail handling equipment for post office; Alvey Ferguson, Inc., Cincinnati, general contractor.

Warsaw, Mo., 2000 tons, bridge.

State of Kansas, 500 tons, derricks.

WESTERN STATES

Boulder City, Neb., 100 tons, supports for walkways; bids opened.

State of Wyoming, 248 tons, bridges in four counties; bids Sept. 12.

State of Colorado, 369 tons, bridges in six counties; bids Sept. 17.

Oakland, Cal., 100 tons, Santa Fe freight depot; bids soon.

Los Angeles, 5500 or 5750 tons, transmission towers for Metropolitan Water District; bids under advisement and not rejected as previously reported.

Los Angeles, 130 tons, traveling crane for city, Specification 1738; bids opened.

Los Angeles, 100 tons, telescoping forms for Metropolitan Water District, Consolidated Steel Corp., low bidder.

FABRICATED PLATES

AWARDS

Elyria, Ohio, 610 tons, 1,000,000 gal. elevated tank, to Pittsburgh-Des Moines Steel Co.

Price, Utah, 250 tons, 12 and 14-in. pipe, to Hardesty Mfg. Co.

Los Angeles, 175 tons, welded ventilating pipe for Department of Water and Power, to Western Pipe & Steel Co.

San Francisco, 175 tons, material for Naval Purchasing Officer, to an unnamed bidder.

NEW PROJECTS

Elyria, Ohio, 1250 tons, welded steel pipe for waterworks extension; C. F. Little Co., Omaha, low bidder.

Oakland, Cal., 2450 tons, 20 and 24-in. electric welded steel pipe for East Bay Municipal Utility District; bids Sept. 18.

Los Angeles, 100 tons, 20-in. welded pipe for United States Engineers; bids opened.

SHEET PILING

AWARDS

Dubuque, Iowa, 1500 tons, dam No. 11, to Inland Steel Co.

Monroe, La., 5000 tons, levee wall, to Jones & Laughlin Steel Corp.

Genoa, Wis., 1800 tons, dam No. 7, to Bethlehem Steel Co.

NEW PROJECTS

Morehead City, N. C., 1300 tons, bulkhead; bids to be taken by city, Oct. 1.

Ca'ro, Ill., 1000 tons, river wall.

Miami, Fla., 350 tons, bulkhead.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel	Base per Lb.
F.o.b. Pittsburgh	1.80c
F.o.b. Chicago	1.85c
F.o.b. Gary	1.85c
F.o.b. Duluth	1.90c
Del'd Detroit	1.95c
F.o.b. Cleveland	1.85c
F.o.b. Buffalo	1.90c
Del'd Philadelphia	2.11c
Del'd New York	2.15c
F.o.b. Birmingham	1.95c
F.o.b. cars dock Gulf ports	2.20c
F.o.b. cars dock Pacific ports	2.35c

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh	1.70c
F.o.b. Chicago	1.75c
F.o.b. Gary	1.75c
F.o.b. Moline, Ill.	1.75c
F.o.b. Cleveland	1.75c
F.o.b. Buffalo	1.80c
F.o.b. Birmingham	1.85c
F.o.b. cars dock Gulf ports	2.10c
F.o.b. cars dock Pacific ports	2.25c

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)	
F.o.b. Pittsburgh	2.05c
F.o.b. Chicago	2.10c
F.o.b. Gary	2.10c
Del'd Detroit	2.20c
F.o.b. Cleveland	2.10c
F.o.b. Youngstown	2.10c
F.o.b. Buffalo	2.10c
F.o.b. Birmingham	2.10c
F.o.b. cars dock Gulf ports	2.45c
F.o.b. cars dock Pacific ports	2.45c

Rail Steel Reinforcing

(Straight lengths as quoted by distributors)	
F.o.b. Pittsburgh	1.90c
F.o.b. Chicago	1.95c
F.o.b. Gary	1.95c
F.o.b. Cleveland	1.95c
F.o.b. Youngstown	1.95c
F.o.b. Buffalo	1.95c
F.o.b. Birmingham	1.95c
F.o.b. cars dock Gulf ports	2.30c
F.o.b. cars dock Pacific ports	2.30c

Iron

F.o.b. Chicago	1.80c
F.o.b. Terre Haute, Ind.	1.75c
F.o.b. Louisville, Ky.	2.10c
F.o.b. Danville, Pa.	1.80c
F.o.b. Berwick, Pa.	1.70c

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	1.95c.
F.o.b. Chicago	2.00c.
F.o.b. Gary	2.00c.
F.o.b. Cleveland	2.00c.
F.o.b. Buffalo	2.05c.
Del'd Detroit	2.15c.
Del'd eastern Michigan	2.20c.

* In quantities of 10,000 to 19,000 lb.

Fence and Sign Posts

Angle Line Posts	Base per Net Ton
F.o.b. Pittsburgh	\$50.00
F.o.b. Chicago	\$50.00
F.o.b. Duluth	\$50.00
F.o.b. Cleveland	\$50.00
F.o.b. Birmingham	\$50.00
F.o.b. Houston, Orange, Beaumont, Galveston	\$50.00
F.o.b. Mobile	\$50.00
F.o.b. New Orleans, Lake Charles, Corpus Christi	\$50.00
F.o.b. cars dock Pacific ports	\$50.00

Plates

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
Del'd Cleveland	1.90c.
F.o.b. Coatesville	1.90c.
F.o.b. Sparrows Point	1.90c.
Del'd Philadelphia	1.90c.
Del'd New York	2.00c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.
Wrought iron plates, f.o.b. P'gh.	3.20c.

Floor Plates

F.o.b. Pittsburgh	3.35c.
F.o.b. Chicago	3.40c.
F.o.b. Coatesville	3.45c.
F.o.b. cars dock Gulf ports	3.75c.
F.o.b. cars dock Pacific ports	3.90c.

Floor Plates

F.o.b. Pittsburgh	2.35c
F.o.b. Chicago	2.40c
F.o.b. Coatesville	2.45c
F.o.b. cars dock Gulf ports	3.75c
F.o.b. cars dock Pacific ports	3.90c

Structural Shapes

Base per Lb.	
F.o.b. Pittsburgh	1.80c
F.o.b. Chicago	1.85c
F.o.b. Cleveland	1.90c
F.o.b. Buffalo	1.90c
F.o.b. Bethlehem	1.90c
Del'd Philadelphia	2.015c
Del'd New York	2.025c
F.o.b. Birmingham (standard)	1.95c
F.o.b. cars dock Gulf ports	2.20c
F.o.b. cars dock Pacific ports	2.35c

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.11c
F.o.b. Chicago	2.25c
F.o.b. Buffalo	2.25c
F.o.b. cars dock Gulf ports.....	2.80c
F.o.b. cars dock Pacific ports.....	2.90c

SHEETS, STRIP, TIN PLATE

TERNE PLATE

Hot Rolled	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.85c
No. 10, f.o.b. Gary	1.85c
No. 10, del'd Detroit	2.05c
No. 10, del'd Phila.	2.10c
No. 10, f.o.b. Birmingham	2.00c
No. 10, f.o.b. cars dock Pacific ports	2.40c

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c
No. 24, f.o.b. Gary	2.50c
No. 24, del'd Detroit	2.60c
No. 24, del'd Phila.	2.71c
No. 24, f.o.b. Birmingham	2.55c
No. 24, f.o.b. cars dock Pacific ports	3.05c
No. 24, wrought iron, Pittsburgh	4.30c

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c
No. 10 gage, f.o.b. Gary	2.60c
No. 10 gage, del'd Detroit	2.70c
No. 10 gage, del'd Phila.	2.81c
No. 10 gage, f.o.b. Birmingham	2.65c
No. 10 gage, f.o.b. cars dock Pacific ports	3.10c

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c
No. 20 gage, f.o.b. Gary	3.05c
No. 20 gage, del'd Detroit	3.15c
No. 20 gage, del'd Phila.	3.26c
No. 20 gage, f.o.b. Birmingham	3.10c
No. 20, f.o.b. cars dock Pacific ports	3.50c

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.10c
No. 24, f.o.b. Gary	3.20c
No. 24, del'd Phila.	3.41c
No. 24, f.o.b. Birmingham	3.25c
No. 24, f.o.b. cars dock Pacific ports	3.70c
No. 24, wrought iron, Pittsburgh	4.95c

Long Ternes

No. 24, unassorted 8-lb. coating	3.40c
F.o.b. Gary	3.50c
F.o.b. cars dock Pacific ports	4.10c

Vitreous Enamel Sheet

No. 20, f.o.b. Pittsburgh	3.10c
No. 20, f.o.b. Gary	3.20c
No. 20, f.o.b. Birmingham	3.70c
No. 20, f.o.b. cars dock Pacific ports	3.70c
No. 10, f.o.b. Pittsburgh	2.50c
No. 10, f.o.b. Gary	2.60c
No. 10, f.o.b. Birmingham	3.10c
No. 10, f.o.b. cars dock Pacific ports	3.10c

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c
No. 28, Gary	2.85c
No. 28, cars dock Pacific Coast	3.35c

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mill	\$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate

(F.o.b. Pittsburgh)	
(Per Package, 20 x 28 in.)	
8-lb. coating I.C.	\$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 In.

	Base per Lb.
All widths up to 24 in., P'gh	1.85c.
All widths up to 24 in., Chicago	1.95c.
All widths up to 24 in., del'd De-	
troit	2.05c.
All widths up to 24 in., Birmingham	2.00c.
Cooperage stock, Pittsburgh	1.95c.
Cooperage stock, Chicago	2.05c.

Cold-Rolled Strips

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.895c.
F.o.b. Worcester	2.80c.

Fender Stock

No. 14, Pittsburgh or Cleveland	2.90c
No. 14, Worcester	3.30c
No. 24, Pittsburgh or Cleveland	3.30c
No. 20, Worcester	3.70c

Hot-Rolled Rail Steel Strips

	Base per Lb.
F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Birmingham	1.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade	Per Lb.
Eight wire	2.30c
Spring wire	2.90c

Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.

To Large-Lot Buyers

	Base per 100 Lb.
Standard wire nails	\$2.40
Smooth coated nails	2.40

	Base per 100 Lb.
Annealed fence wire	\$2.45
Galvanized fence wire	2.80
Polished staples	3.10
Galvanized staples	3.35
Barbed Wire, galvanized	2.80
Twisted barbless wire	2.80
Woven wire fence, base column	58.00
Single loop bale ties, base column	53.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are \$2 a ton over Pittsburgh (except for woven wire fence at Duluth, which is \$3 over Pittsburgh), and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh, while Pacific Coast prices are \$8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are \$11 a ton above Pittsburgh.

On staples and barbed wire, prices of \$6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

Wire Hoops, Twisted or Welded

Off List	
F.o.b. Pittsburgh	35 and 2½ off
F.o.b. Chicago	35 off

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Inches	Steel	Black Galv.	Wrought Iron	Inches	Black Galv.
1/4	51%	29%	1/4	+9 1/2	+138
3/8	53%	35	3/8	+4 1/2	+21%
1/2	55%	47	1/2	31%	15
3/4	62	52	3/4	36%	20%
1 to 2	64	55	1 to 2	41%	25%
			2	43%	28
			2	41%	26

Lap Weld

2	60	51	2	37	22%
2 1/2	63	54	2 1/2	38	25
3 1/2	65	56	3 1/2	40	28%
7 and 8	64	54	9 to 12	38	24%
9 and 10	63%	53%			
11 and 12	62%	52%			

Butt Weld, extra strong, plain ends

1/4	46%	33%	1/4	+13	+45%
3/8	51	38	3/8	+4 1/2	+24%
1/2	54%	47%	1/2	32%	17%
3/4	61	52	3/4	37%	22%
1 to 2	63	55	1 to 2	43%	29

Lap Weld, extra strong, plain ends

2	58	50	2	48	26
2 1/2	62	54	2 1/2	43%	33
3 1/2	65%	57%	4 1/2	45	33%
7 and 8	64%	54%	7 & 8	46	33
9 and 10	63%	53%	9 to 12	41%	30
11 and 12	62%	52%			

On standard steel pipe an extra 5% off is allowed on sales to consumers while two 5's off apply on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5's off are allowed

to consumers and three 5's off to jobbers. Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the port producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

	Cold Drawn	Hot Rolled
1 in. o.d. 13 B.W.G.	\$ 8.60	\$ 7.32
1 1/4 in. o.d. 13 B.W.G.	10.19	8.28
1 3/4 in. o.d. 13 B.W.G.	11.38	10.28
2 in. o.d. 13 B.W.G.	12.81	11.64
2 1/4 in. o.d. 13 B.W.G.	14.35	13.94
2 3/4 in. o.d. 13 B.W.G.	16.00	14.54
3 in. o.d. 12 B.W.G.	17.51	16.01
3 1/4 in. o.d. 12 B.W.G.	19.29	17.54
3 3/4 in. o.d. 12 B.W.G.	20.45	18.50
4 in. o.d. 12 B.W.G.	21.48	19.50
4 1/4 in. o.d. 12 B.W.G.	23.08	21.35
4 3/4 in. o.d. 11 B.W.G.	27.09	24.62
4 in. o.d. 10 B.W.G.	33.60	30.54
4 1/4 in. o.d. 10 B.W.G.	41.08	37.35
5 in. o.d. 9 B.W.G.	51.56	46.87
6 in. o.d. 7 B.W.G.	79.15	71.96

Extras for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
12,000 lb. or ft. to 24,999 lb. or ft.	12 1/2 %
6,000 lb. or ft. to 11,999 lb. or ft.	25 %
2,000 lb. or ft. to 5,999 lb. or ft.	35 %
Under 2,000 lb. or ft.	50 %

Lapweld Steel and Knobbled Charcoal Iron Pressure Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

	Steel	Iron
1 1/4 in. o.d. 13 B.W.G.	\$ 9.72	\$20.16
1 3/4 in. o.d. 13 B.W.G.	11.06	21.84
2 in. o.d. 13 B.W.G.	12.18	17.23
2 1/4 in. o.d. 13 B.W.G.	13.79	19.79
2 3/4 in. o.d. 12 B.W.G.	16.88	24.19
3 in. o.d. 12 B.W.G.	17.54	26.46
3 1/4 in. o.d. 12 B.W.G.	18.35	28.39
3 3/4 in. o.d. 11 B.W.G.	21.66	33.95
4 in. o.d. 11 B.W.G.	23.15	34.16
4 1/4 in. o.d. 10 B.W.G.	28.66	45.56
4 3/4 in. o.d. 10 B.W.G.	35.23	50.48
5 in. o.d. 9 B.W.G.	44.35	61.86
6 in. o.d. 7 B.W.G.	68.14	102.46

Quantity Extras:

40,000 lb. or ft.	base
25,000 lb. or ft. to 39,999 lb. or ft.	plus 5%
10,000 lb. or ft. to 24,999 lb. or ft.	plus 12½%
2,000 lb. or ft. to 9,999 lb. or ft.	plus 25%
Under 2,000 lb. or ft.	plus 40%

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List	
Machine bolts	70, 10 and 5
Carriage bolts	70, 10 and 5
Lag bolts	70, 10 and 5
Plow bolts, Nos. 1, 2, 3 and 7	70, 10 and 5
heads	70, 10 and 5
Hot-pressed nuts, blank or tapped	70, 10 and 5
square	70, 10 and 5
Hot-pressed nuts, blank or tapped	70, 10 and 5
hexagon	70, 10 and 5
C.p.e. and t. square or hex. nuts	70, 10 and 5
blank or tapped	70, 10 and 5
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes to and incl. 1 in. diameter	70, 10 and 5
Larger than 1 in. diameter	70
Store bolts in packages, Pittsburgh	75
Store bolts in packages, Chicago	75
Store bolts in packages, Cleveland	75
Store bolts in bulk, Pittsburgh	83
Store bolts in bulk, Chicago	83
Store bolts in bulk, Cleveland	83
Tire bolts	90 and 5

Large Rivets
(1/2-in. and larger)

Base per 100 Lb.	
F.o.b. Pittsburgh or Cleveland	\$2.90
F.o.b. Chicago	3.00
F.o.b. Birmingham	3.05

Small Rivets
(7/16-in. and smaller)

Per Cent Off List	
F.o.b. Pittsburgh	70 and 5
F.o.b. Cleveland	70 and 5
F.o.b. Chicago and Birmingham	70 and 5

Cap and Set Screws
(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List	
Milled cap screws, 1 in. dia. and smaller	85 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread 1/2 in. and smaller	75
Upset hex. head cap screws, U.S.S. or S.A.E. thread, 1 in. dia. and smaller	87 1/2
Upset set screws, cut and oval point	80
Milled studs	65 to 85 and 10

Alloy and Stainless Steel

Alloy Steel Ingots
F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Uncropped \$40 per gross ton

Alloy Steel Blooms, Billets and Slabs
F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, \$49 a gross ton.

Alloy Steel Bars
Price del'd Detroit is \$52.
F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base 2.45c.
Delivered price at Detroit is 2.60c.
S.A.E. Alloy Differential per 100 lb.

Numbers	
2000 (1/2% Nickel)	0.25
2100 (2% Nickel)	0.55
2300 (3 1/2% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars 1/2c. per lb. higher with separate extras. Blooms, billets and slabs under 4 1/2 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars
F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo. 2.95c. base per lb.

STAINLESS STEEL No. 302
(17 to 19% Cr. 7 to 9% Ni. 0.08 to 0.20% C.)
(Base Prices f.o.b. Pittsburgh)

Per Lb.	
Forging billets	19.55c.
Rerolling slabs	15c.
Bars	23c.
Plates	23c.
Structural shapes	23c.
Sheets	23c.
Hot-rolled strip	20 1/2c.
Cold-rolled strip	27c.
Drawn wire	23c.

Raw and Semi-Finished Steel

Carbon Steel Rerolling Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Uncropped \$29 per gross ton

Carbon Steel Forging Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Uncropped \$31 per gross ton

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Per Gross Ton

Rerolling \$27.00
Forging quality 35.00

Delivered Detroit
Rerolling \$30.00
Forging 38.00

Billets Only F.o.b. Duluth
Rerolling \$29.00
Forging 37.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.
Per Gross Ton

Open-hearth or Bessemer \$28.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.
Per Lb.

Grooved 1.70c.
Universal 1.70c.
Sheared 1.70c.

Tube Rounds

F.o.b. Pittsburgh 1.80c.
F.o.b. Chicago 1.85c.
F.o.b. Cleveland 1.85c.
F.o.b. Buffalo 1.90c.
F.o.b. Birmingham 1.95c.

Wire Rods

(Common, base)

F.o.b. Pittsburgh \$35.00
F.o.b. Cleveland 38.00
F.o.b. Chicago 39.00
F.o.b. Anderson, Ind. 39.00
F.o.b. Youngstown 39.00
F.o.b. Worcester, Mass. 40.00
F.o.b. Birmingham 41.00
F.o.b. San Francisco 47.00
F.o.b. Galveston 44.00

CANADA

Pig Iron

Per gross ton:

Delivered Toronto
No. 1 fdy., sil. 2.25 to 2.75 \$21.00
No. 2 fdy., sil. 1.75 to 2.75 23.50
Malleable 21.00

Delivered Montreal
No. 1 fdy., sil. 2.25 to 2.75 \$22.50
No. 2 fdy., sil. 1.75 to 2.25 22.00
Malleable 22.50
Basic 22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.
Per Gross Ton
Domestic, 80% (carload) \$35.00

Spiegeleisen

Per Gross Ton Furnace
Domestic, 19 to 21% \$28.00
50-ton lots 3-mo. shipment 24.00
F.o.b. New Orleans 26.00

Electric Ferrosilicon

Per Gross Ton Delivered
50% (carloads) \$17.50
50% (ton lots) 35.00
75% (carloads) 128.00
75% (ton lots) 136.00

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
0% \$22.75	12% \$29.25		
7% 23.75	13% 30.75		
8% 24.75	14% 32.25		
9% 25.75	15% 33.75		
10% 26.75	16% 35.25		
11% 27.75	17% 36.75		

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.55 a ton higher than at Jackson.

Manganese 2 to 3%, \$1 a ton additional.
For each unit of manganese over 3%, \$1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
10% \$27.75	14% \$33.25		
11% 28.75	15% 34.75		
12% 29.25	16% 36.25		
13% 31.75	17% 37.75		

Manganese 2 to 3%, \$1 a ton additional.
For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W. del., carloads \$1.35 to \$1.45
Ferrotungsten, less carloads 1.45 to 1.55
Ferromanganese, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered, in carloads 10.00c.
Ferromanganese, 2% carbon 16.50c. to 17.00c.
Ferromanganese, 1% carbon 17.50c. to 18.00c.
Ferromanganese, 0.10% carbon 19.50c. to 20.00c.
Ferromanganese, 0.06% carbon 20.00c. to 20.50c.
Ferromanganese, del. per lb. contained V. \$2.70 to \$2.90
Ferrocobalt, 15 to 18% Ti, 6 to 8% C. f.o.b. furnace carload and contract per net ton \$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18% Rockdale, Tenn., base, per gross ton with \$2 unitage 50.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton with \$2.75 unitage 65.00
Ferromolybdenum, per lb. Mo., del. 95c.
Calcium molybdate, per lb. Mo., del. 80c.
Silico spiegel, per ton, f.o.b. furnace, carloads \$38.00
Ton lots or less, per ton 45.50
Silico-manganese, gross ton, delivered 2.50% carbon grade 90.00
2% carbon grade 95.00
1% carbon grade 105.00
Spot prices \$5 a ton higher

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	\$19.50	\$20.00	\$19.00	\$20.50
Bethlehem, Pa.	19.50	20.00	19.00	20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Steelton, Pa.	19.50	20.00	19.00	20.50
Sparrows Point, Md.	18.50	18.50	18.00	19.00
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown	18.50	18.50	18.00	19.00
Buffalo	18.50	19.00	17.50	19.50
Eric, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, Ohio	18.50	18.50	18.00	19.00
Jackson, Ohio	20.25	20.25	19.75	20.75
Detroit	18.50	18.50	18.00	19.00
Hamilton, Ohio	18.50	18.50	18.00	19.00
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	18.50	18.00	19.00
Duluth, Minn.	19.00	19.00	18.50	19.50
Birmingham	14.50	14.50	13.50	14.50
Provo, Utah	17.50	17.50	17.00	17.50

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District	\$20.00	\$20.50	\$19.50	\$21.00
From Everett, Mass.				
Brooklyn	21.9280	22.4280	21.9280	22.9280
Newark or Jersey City, N. J.	20.9873	21.4873	20.4873	21.9873
From East. Pa.				
Philadelphia	20.3132	20.8132	19.8132	21.3132
From Eastern Pa.				
Cincinnati	19.5807	19.5807	19.0807	20.0807
From Hamilton, Ohio				
Canton, Ohio	19.3402	19.3402	19.3402	20.3402
From Cleveland and Youngstown				
Columbus, Ohio	20.64	20.64		
From Hamilton, Ohio				
Manassas, Ohio	20.3832	20.3832		
From Cleveland and Toledo				
Indianapolis	20.9289	20.9289		
From Hamilton, Ohio				
South Bend, Ind.	20.6935	20.6935		
From Chicago				
Milwaukee	19.57	19.57		
From Chicago				
St. Paul	20.94			
From Duluth				
Davenport, Iowa	20.3832	20.3832		
From Chicago				
Kansas City	21.2178	21.2178		
From Granite City				
San Francisco, Los Angeles or Seattle, From Provo	22.315			

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y. \$23.50

GRAY FORGE PIG IRON

Valley furnace \$18.00
Pittsburgh district furnace 18.00

CHARCOAL PIG IRON

Lake Superior furnace \$21.00
Delivered Chicago 24.2528
Delivered Buffalo 24.595

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$13.00 to \$13.50
No. 2 heavy melting steel	12.00 to 12.50
No. 3 railroad wrought	13.50 to 14.00
Scrap rails	14.00 to 14.50
Rails, 3 ft. and under	15.00 to 15.50
Compressed sheet steel	13.00 to 13.50
Hand bundled sheet steel	12.00 to 12.50
Hvy. steel axle turnings	11.00 to 11.50
Machine shop turnings	9.50 to 10.00
Short shov. turnings	9.50 to 10.00
Short mixed borings and turnings	7.00 to 7.50
Cast iron borings	7.00 to 7.50
Cast iron carwheels	14.00 to 14.50
Heavy breakable cast	12.25 to 12.75
No. 1 cast	14.00 to 14.50
Railr. knuckles and couplers	15.00 to 15.50
Rail. coil and leaf springs	15.50 to 16.00
Roller steel wheels	15.50 to 16.00
Low phos. billet crops	16.00 to 16.50
Low phos. sheet bar crops	15.50 to 16.00
Low phos. punchings	15.00 to 15.50
Low phos. plate scrap	14.50 to 15.00
Steel car axles	14.25 to 14.75

CHICAGO

Delivered Chicago district consumers:

Per Gross Ton

Heavy melting steel	\$12.25 to \$12.75
Automobile hvy. melt. steel	11.25 to 11.75
Shoveling steel	12.25 to 12.75
Hydraulic comp. sheets	11.50 to 12.00
Drop forge flashings	9.50 to 10.00
No. 1 busheling	11.00 to 11.50
Roller carwheels	12.75 to 13.25
Railroad tires	12.25 to 12.75
Railroad leaf springs	12.75 to 13.25
Steel couplers and knuckles	12.25 to 12.75
Roller wheels	12.75 to 13.25
Coll. and leaf springs	14.25 to 14.75
Coll. turnings (elec. fur.)	11.50 to 12.00
Low phos. punchings	14.50 to 15.00
Low phos. plates, 12 in. and under	14.50 to 15.00
Cast iron borings	6.00 to 6.50
Short shoveling turnings	6.75 to 7.25
Machine shop turnings	7.00 to 7.50
Rerolling rails	13.50 to 14.00
Steel rails, less than 3 ft.	13.50 to 14.00
Steel rails, less than 3 ft.	15.00 to 15.50
Angle bars	14.00 to 14.50
Cast iron carwheels	12.75 to 13.25
Railroad malleable	14.75 to 15.25
Agricultural malleable	10.25 to 10.75

Per Net Ton

Iron car axles	\$15.50 to \$16.00
Steel car axles	14.75 to 15.25
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	11.00 to 11.50
No. 3 busheling	6.50 to 7.00
Locomotive tires, smooth	11.50 to 12.00
Pipes and flues	7.00 to 7.50
No. 1 machinery cast	11.25 to 11.75
Clean automobile cast	10.50 to 11.00
No. 1 railroad cast	10.00 to 10.50
No. 2 agricultural cast	10.00 to 10.50
Stove plate	8.00 to 8.50
Grate bars	8.00 to 8.50
Brake shoes	8.00 to 8.50

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$12.50
No. 2 heavy melting steel	\$11.25 to \$11.50
Hydraulic compressed, new	10.00 to 10.50
Hydraulic compressed, old	8.50 to 9.00
Steel rails for rolling	14.00 to 14.50
Cast iron carwheels	11.50 to 12.00
Heavy breakable cast	11.00 to 11.50
No. 1 cast	11.50 to 12.00
Stove plate (steel works)	9.00 to 9.50
Machine shop turnings	7.00 to 7.50
No. 1 blast furnace	5.00 to 5.50
Heavy axle turnings	14.00 to 14.50
Cast borings	5.00 to 5.50
No. 1 low phos. heavy	14.50 to 15.00
Couplers and knuckles	14.00 to 14.50
Roller steel wheels	14.00 to 14.50
Steel axles	16.00
Shafting	17.50
No. 1 railroad wrought	12.00 to 12.50
Spec. iron and steel pipe	9.50 to 10.00
Bundled sheets	9.50 to 10.00
No. 1 forge fire	9.50 to 10.00
Cast borings (chem.)	10.50 to 11.00

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$9.00 to \$9.50
No. 2 heavy melting steel	7.50 to 8.00
Scrap rails for melting	8.75 to 9.25
No. 1 sheet clippings	5.50 to 6.00
Bundled sheets	6.75 to 7.25
Cast iron borings	5.00 to 5.50
Machine shop turnings	5.25 to 5.75
No. 1 busheling	6.75 to 7.25
No. 2 busheling	3.25 to 3.75
Rails for rolling	9.75 to 10.25
No. 1 locomotive tires	8.00 to 8.50
Short shov. turnings	12.50 to 13.00
Cast iron carwheels	9.50 to 10.00
No. 1 machinery cast	10.00 to 10.50
No. 1 railroad cast	9.25 to 9.75
Turn cast	6.75 to 7.25
Stove plate	6.75 to 7.25
Agricultural malleable	8.75 to 9.25
Railroad malleable	10.00 to 10.50

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$12.00 to \$12.25
No. 2 heavy melting steel	11.00 to 11.25
Compressed sheet steel	10.75 to 11.25
Light bundled sheet stampings	9.25 to 9.75
Drop forge flashings	10.50 to 11.00
Machine shop turnings	7.75 to 8.25
Short shoveling turnings	7.50 to 8.00
No. 1 busheling	10.50 to 11.00
Steel axle turnings	10.50 to 11.00
Low phos. billet crops	15.00 to 15.50
Cast iron borings	7.75 to 8.25
Mixed borings and short turnings	7.75 to 8.25
No. 2 busheling	7.75 to 8.25
No. 1 cast	12.50 to 13.00
Railroad grate bars	7.00 to 7.50
Stove plate	7.50 to 8.00
Rails under 3 ft.	13.00 to 13.50
Rails for rolling	15.50 to 16.00
Railroad malleable	14.50 to 15.00
Cast iron carwheels	10.75 to 11.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	\$11.50 to \$12.00
No. 2 heavy melting steel	10.50 to 11.00
Scrap rails	12.00 to 12.50
New hydraulic comp. sheets	10.50 to 11.00
Old hydraulic comp. sheets	9.50 to 10.00
Drop forge flashings	10.50 to 11.00
No. 1 busheling	10.50 to 11.00
Hvy. steel axle turnings	10.50 to 11.00
Machine shop turnings	5.50 to 6.00
Knuckles and couplers	13.00 to 14.00
Coll. and leaf springs	13.00 to 14.00
Roller steel wheels	13.00 to 14.00
Low phos. billet crops	14.50 to 15.00
Short shov. steel turnings	7.00 to 7.50
Short mixed borings and turnings	7.00 to 7.50
Cast iron borings	7.00 to 7.50
No. 2 busheling	7.00 to 7.50
Steel car axles	12.50 to 13.00
Iron axles	12.50 to 13.00
No. 1 machinery cast	12.00 to 12.50
No. 1 cupola cast	11.50 to 12.00
Stove plate	10.00 to 10.50
Steel rails, 3 ft. and under	14.00 to 14.50
Cast iron carwheels	12.00 to 12.50
Railroad malleable	13.50 to 14.00
Chemical borings	9.00 to 9.50

BOSTON

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$9.25 to \$9.50
No. 1 heavy melting steel	7.00 to 7.40
Scrap rails	7.00 to 7.50
No. 2 steel	8.25 to 8.50
No. 2 steel	6.00 to 6.40
Breakable cast	6.00 to 6.25
Machine shop turnings	3.25 to 3.65
*Machine shop turnings	4.50 to 5.00
Bundled skeleton, long	6.00 to 6.15
Forge flashings	6.00 to 6.40
Shafting	12.00 to 12.50
Steel car axles	12.00 to 12.50
Cast iron borings	5.00 to 5.50

Per gross ton delivered consumers' yards:

Textile cast	\$9.25 to \$10.00
No. 1 machinery cast	9.50 to 10.00
Stove plate	6.00 to 6.50
Railroad malleable	11.00 to 11.50

* Delivered local army base.

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$8.50 to \$8.75*
No. 2 heavy melting steel	7.50 to 7.75*
Heavy breakable cast	6.75 to 7.25
No. 1 machinery cast	7.00 to 7.50
No. 2 cast	6.50 to 7.00
Stove plate	6.50 to 7.00
Steel car axles	13.50 to 14.00
Shafting	12.50 to 13.75
No. 1 railroad wrought	7.75 to 8.25
No. 1 yard wrought, long	6.75 to 7.25
Spec. iron and steel pipe	5.50 to 6.00
Forge fire	6.50 to 7.00
Rails for rolling	9.00 to 10.00
Short shoveling turnings	9.00 to 9.25
Machine shop turnings	3.50 to 4.00
Cast borings	3.50 to 3.75
No. 1 blast furnace	2.00 to 2.50
Cast borings (chemical)	11.00 to 11.50
Unprepared yard iron and steel	5.00 to 5.50

Per gross ton, delivered local foundries:

No. 1 machinery cast	\$10.50
No. 1 hvy. cast (cupola size)	9.50
No. 2 cast	8.00

* Loading on barge.
* 25c. higher offered at nearby New Jersey points.

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	\$7.50 to \$8.50
Scrap steel rails	10.00 to 10.50
Short shoveling turnings	7.00
Stove plate	7.00
Steel axles	11.50
Iron axles	11.50
No. 1 railroad wrought	7.00
Rails for rolling	12.50
No. 1 cast	10.00 to 10.50
Tramcar wheels	10.00

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	\$9.25 to \$9.75
No. 1 heavy melting	8.75 to 9.25
No. 2 heavy melting	7.75 to 8.25
No. 1 locomotive tires	9.75 to 10.25
Misc. stand-sec. rails	11.00 to 11.50
Railroad springs	12.00 to 12.50
Bundled sheets	6.00 to 6.50
No. 2 railroad wrought	9.25 to 9.75
No. 1 busheling	5.00 to 5.50
Cast iron borings and shoveling turnings	3.00 to 3.50
Rails for rolling	11.50 to 12.00
Machine shop turnings	3.75 to 4.25
Heavy turnings	5.50 to 6.00
Steel car axles	12.50 to 13.00
Iron car axles	15.00 to 15.50
No. 1 railroad wrought	7.00 to 7.50
Steel rails less than 3 ft.	12.00 to 12.50
Steel angle bars	12.00 to 12.50
Cast iron carwheels	9.00 to 9.50
No. 1 machinery cast	9.50 to 10.00
Railroad malleable	11.25 to 11.75
No. 1 railroad cast	9.00 to 9.50
Stove plate	8.50 to 9.00
Agricult. malleable	8.50 to 9.00

DETROIT

Dealers' buying prices per gross ton:

Heavy melting steel	\$9.50 to \$10.00
Borings and short turnings	5.50 to 6.00

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50% iron	\$4.30
Old range, non-Bessemer, 51.50% iron	4.65
Measbl. Bessemer, 51.50% iron	4.65
Measbl. non-Bessemer, 51.50% iron	5.50
High phosphorus, 51.50% iron	4.40

Foreign Ore

C.A.F. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algeria	10.50c.
Iron, low phos., Swedish, average 68% iron	10.50c.
Iron, basic or foundry, Swedish, aver. 65% iron	9.50c.
Iron, basic or foundry, Russian, aver. 65% iron	9.50c.
Manganese, Caucasian, washed 82%	25c.
Manganese, African, Indian, 44-48%	22c.
Manganese, African, Indian, 49-51%	24c.
Manganese, Brazilian, 46 to 48%	20c.

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid, delivered	\$15.50 to \$16.00
Tungsten, domestic, wolframite, delivered	15.00

Per Gross Ton

Chrome, 45% Cr ₂ O ₃ , lump, c.i.f. Atlantic Seaboard (Africa)	\$17.50
45 to 46% Cr ₂ O ₃ (Turkish)	16.00 to 16.50
48% Cr ₂ O ₃ (African)	20.50
48% min. Cr ₂ O ₃ (Turkish)	19.25
Chrome concentrate, 50% and over Cr ₂ O ₃ , c.i.f. Atlantic Seaboard	22.00
52% Cr ₂ O ₃ (Turkish)	21.75
48 to 49% Cr ₂ O ₃ (Turkish)	19.25

Fluorspar

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines for all-rail shipment	\$14.00 to \$15.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	14.00 to 15.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	14.00 to 15.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	12.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke

Per Net Ton

Furnace, f.o.b. Connellsville	\$23.25 to \$23.50
Prompt, f.o.b. Connellsville	6.00 to 6.10
Foundry, by-product, Chicago ovens, for delivery outside switching district	8.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	11.00
Foundry, by-product, Newark or Jersey City, del'd	9.24 to 9.72
Foundry, by-product, Phila. land, delivered	9.03
Foundry, by-product, Cleveland, delivered	9.25
Foundry, Birmingham	6.00

Long turnings	\$5.25 to \$5.75
No. 1 machinery cast	12.00 to 12.50
Automotive cast	12.50 to 13.00
Hydraulic comp. sheets	10.00 to 10.50
Stove plate	7.50 to 8.00
New factory busheling	8.50 to 9.00
Old No. 2 busheling	8.00 to 8.50
Sheet clippings	6.50 to 7.00
Flashings	8.00 to 8.50
Low phos. plate scrap	10.00 to 10.50

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	\$7.00	\$7.00
Rails scrap	8.00	8.00
Machine shop turnings	3.00	3.00
Boiler plate	4.50	4.50
Heavy axle turnings	4.50	4.00
Cast borings	4.00	3.50
Steel borings	2.00	2.00
Wrought pipe	3.50	3.50
Steel axles	7.00	8.00
Axles, wrought iron	7.00	8.00
No. 1 machinery cast	9.00	9.00
Stove plate	5.50	5.50
Standard carwheels	7.25	7.00
Malleable	6.75	7.00

Foundry, by-product, St. Louis, f.o.b. ovens, del'd

Foundry, by-product, del'd St. Louis	9.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal

Per Net Ton

Mine run steam coal, f.o.b. W. Pa. mines	\$1.45 to \$1.65
Mine run coking coal, f.o.b. W. Pa. mines	1.75 to 1.95
Gas coal, 1/2-in., f.o.b. Pa. mines	1.85 to 2.35
Mine run gas coal, f.o.b. Pa. mines	1.75 to 1.95
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.

No. 3 distillate	4.25c.
No. 4 industrial	3.97 1/2c.

Per Gal. f.o.b. Baltimore

No. 3 distillate	4.25c.
No. 4 industrial	3.97 1/2c.

Per Gal. del'd Chicago

No. 3 industrial fuel oil	4.75c.
No. 5 industrial fuel oil	3.75c.

Per Gal. f.o.b. Cleveland

No. 3 distillate	5.25c.
No. 4 industrial	5.13 1/2c.
No. 5 industrial	4.25c.

REFRACTORIES

Fire Clay Brick

Per 1000 f.o.b. Works

	High-heat Intermediate Duty Brick	Duty Brick
Pennsylvania	\$45.00	\$40.00
Maryland	5.00	43.00
New Jersey	50.00	43.00
Ohio	45.00	40.00
Kentucky	45.00	40.00
Missouri	45.00	40.00
Illinois	45.00	40.00
Ground fire clay, per ton	7.00	

Silica Brick

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock:	
Rounds and hexagons	3.20c.
Squares and flats	3.20c.
Hoops and bands under 1/4 in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.35c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$3.60
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count, 65 per cent off list	
Machine bolts, 100 count, 65 per cent off list	
Carriage bolts, 100 count, 65 per cent off list	
Nuts, all styles, 100 count, 65 per cent off list	
Large rivets, base per 100 lb.	\$3.50
Wire, black, soft ann'd, base per 100 lb.	\$2.70
Wire, galv. soft, base per 100 lb.	\$2.925
Common wire nails, per keg	\$2.834
Cement coated nails, per keg	\$2.834

On plates, structural, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lbs.
*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.20c.
Soft steel bars	2.95c.
Cold-fn. steel bars:	
Rounds and hexagons	3.35c.
Flats and squares	3.35c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.35c.
Galv. sheets (No. 24)	4.55c.
Hot rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.85c.
Rivets, boiler (keg lots)	3.75c.
Machine bolts	Per Cent Off List
Carriage bolts	Per Cent Off List
Lag screws	Per Cent Off List
Hot-pressed nuts, sq. tap. or	Per Cent Off List
Hot-pressed nuts, sq. tap or blank	Per Cent Off List
Hot-pressed nuts, hex. tap or blank	Per Cent Off List
Hex. head cap screws	Per Cent Off List
Cut point set screws	Per Cent Off List
Flat head bright wood screws	Per Cent Off List
Spring cotter pins	Per Cent Off List
Stove bolts in full packages	Per Cent Off List
Rd. hd. tank rivets, 7/16 in. and smaller	Per Cent Off List
Wrought washers	Per Cent Off List
Black ann'd wire per 100 lb.	\$3.85
Com. wire nails, base per keg	\$2.95
Cement c'd nails, base per keg	\$2.95

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumer's plants within the Chicago switching district.
*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 85 per cent off. Discounts applying to country trade are 70 per cent off. f.o.b., Chicago, with full or partial freight allowed up to 50c. per 100 lb.
†Prices for city and suburbs only.

NEW YORK

	Base per Lb.
Plates, 1/4 in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, small shapes	3.36c.
Iron bars	3.36c.
Iron bars, swed. charcoal	6.75c. to 7.00c.
Cold-fn. shafting and screw stock:	
Rounds and hexagons	3.31c.
Flats and squares	4.31c.
Cold-rolled; strip, soft and quarter hard	3.30c.
Hoops	3.50c.
Bands	3.50c.
Hot-rolled sheets (No. 10)	3.31c.
Hot-rolled ann'd sheets (No. 24)	3.80c.
Galvanized sheets (No. 24)	4.50c.
Long term sheets (No. 24)	5.20c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.40c.
Wire, galv. (No. 10)	3.75c.
Tire steel, 1 x 1/4 in. and larger	3.85c.
Open hearth spring steel	4.00c. to 10.00c.
Common wire nails, base, per keg	\$3.21
Machine bolts, cut thread:	Off List
All diameters	65 and 10
Carriage bolts, cut thread:	Off List
All diameters	65 and 10

	Per 100 Ft.
Boiler tubes:	
Lap welded, 2-in.	\$18.95
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.45c.
Bars, soft steel or iron	3.20c.
Cold-fn. rounds, shafting, screw stocks	3.60c.
Hot-rolled annealed sheets (No. 24)	4.10c.
Galv. sheets (No. 24)	4.65c.
Hot-rolled sheets (No. 10)	3.30c.
Black corrug. sheets (No. 24)	4.10c.
*Galv. corrug. sheets	4.65c.
Structural rivets	4.00c.
Boiler rivets	4.10c.
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, pivot bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts:	
All quantities	70

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, 1/4-in. and heavier	2.98c.
*Structural shapes	2.98c.
*Soft steel bars, small shapes, iron bars (except bands)	2.98c.
*Reinforce. steel bars, sq. twisted and deformed	2.98c.
Cold-finished steel bars	3.61c.
*Steel hoops	3.45c.
*Steel bands, No. 12 and 3/16 in. incl.	3.18c.
Spring steel	5.00c.
Hot-rolled anneal. sheets (No. 24)	3.65c.
Galvanized sheets (No. 24)	4.30c.
Hot-rolled annealed sheets (No. 10)	3.08c.
Diam. pat. floor plates, 1/4 in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.
*Base prices subject to deduction on orders aggregating 4000 lb. or over.
†For 50 bundles or over.
‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c.
Soft steel bars	2.95c.
Reinforce. steel bars	2.10c.
Cold-finished steel bars	3.25c.
Flat-rolled steel under 1/4 in.	3.30c.
Cold-finished strip	13.00c.
Hot-rolled annealed sheets (No. 24)	3.95c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
Black ann'd wire, per 100 lb.	\$2.65
No. 9 galv. wire, per 100 lb.	3.60
Com. wire nails, base per keg	2.40

†Outside delivery 10c. less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.42c.
Bars, soft steel or iron	3.17c.
New billet reinforce. bars	3.35c.
Rail steel reinforce. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.47c.
Cold-finished bars	3.57c.
Hot-rolled annealed sheets (No. 24)	4.02c.
Galv. sheets (No. 24)	4.72c.
Hot-rolled sheets (No. 10)	3.22c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'd wire, per 100 lb. (1000 lb. or over)	\$2.88
Com. wire nails, base per keg:	
Any quantity less than carload	3.04
Cement c'd nails, base 100-lb. keg	3.50
Chain, 1-in. per 100 lb.	3.35
Seamless steel boiler tubes, 2-in.	\$22.66
4-in.	48.14
Lap-welded steel boiler tubes, 2-in.	19.35
4-in.	45.30

BUFFALO

	Base per Lb.
Plates	3.38c.
Struc. shapes	3.25c.
Soft steel bars	3.00c.
Reinforcing bars	2.90c.

Cold-fn. flats and sq.	3.40c.
Round and hex.	3.40c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.06c.
Heavy hot-rolled sheets, 3/16 in., 24 to 48 in. wide	3.63c.
Galv. sheets (No. 24)	4.70c.
Bands	3.43c.
Hoops	3.43c.
Heavy hot-rolled sheets	3.18c.
Com. wire nails, base per keg	\$3.35
Black wire, base per 100 lb. (2500 lb. lots or under)	3.55
(Over 2500 lb.)	3.45

BOSTON

	Base per Lb.
Beams, channels, angles, tees, zees	3.54c.
H beams and shapes	3.51c.
Plates—sheered, tank and univ. mill, 1/4 in. thick and heavier	3.58c.
Flats—plate, diamond pattern	3.58c.
Bar and bar shapes (mild steel)	3.35c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.65c. to 4.65c.
Half rounds, half ovals, ovals and bevels	4.60c.
Tire steel	4.90c.
Cold-rolled strip steel	3.245c.
Cold-finished rounds, squares and hexagons	3.90c.
Cold-finished flats	3.75c.
Blue annealed sheets, No. 10 ga.	3.65c.
One pass cold-rolled sheets No. 24 ga.	4.20c.
Galvanized steel sheets, No. 24 ga.	4.90c.
Lead coated sheets, No. 24 ga.	5.85c.

Prices delivered by truck in metropolitan Boston. subject to quantity differentials.

DETROIT

	Base per Lb.
Soft and bars	3.04c.
Structural shapes	3.42c.
Plates	3.42c.
Floor plates	3.17c.
Hot-rolled annealed sheets (No. 24)	3.94c.
Hot-rolled sheets (No. 10)	3.14c.
Galvanized sheets (No. 24)	4.72c.
Bands	3.39c.
Hoops	3.38c.
Cold-finished bars	3.48c.
Cold-rolled strip	3.18c.
Hot-rolled alloy steel (S.A.E. 5100 Series)	5.29c.*
Boils and nuts...	70 and 5 per cent off list

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials.
*Price applies to 1,000 lb. and over.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.31c.
Soft steel bars	3.06c.
Hot-rolled strip	3.41c.
Hot-rolled sheets (No. 10)	3.16c.
Hot-rolled annealed sheets (No. 24)	3.98c.
Galvanized sheets (No. 24)	4.66c.
Cold-finished steel bars	3.46c.
Cold-rolled strip	3.33c.
Structural rivets (keg lots)	3.86c.
Boiler rivets (keg lots)	3.96c.
Track spikes (keg lots)	3.71c.
Track bolts (keg lots)	4.66c.
Black annealed wire	3.10c.
Com. wire nails	2.90c.
Cement coated nails	2.90c.
Machine bolts	Per Cent Off List
Carriage bolts	Per Cent Off List
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	70 and 10

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars	3.20c.
Structural shapes	3.45c.
Plates	3.45c.
Cold-finished bars	3.87c.
Bands and hoops	3.55c.
Hot-rolled annealed sheets, No. 24	3.90c.
Galvanized sheets, No. 24	4.50c.
Cold-rolled sheets, No. 20	4.95c.

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On cold-finished bars, hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over.

BALTIMORE

	Base per Lb.
*Mild steel bars	2.95c.
*Iron bars	2.95c.

*Reinforcing bars	2.95c.
*Structural shapes	3.00c.
*Plates	3.00c.
*Hot-rolled sheets, No. 10	3.10c.
*Hot-rolled annealed sheets, No. 24	3.60c.
*Galvanized sheets, No. 24	4.30c.
*Bands	3.20c.
*Hoops	3.45c.
*Cold-rolled rounds	3.58c.
*Cold-rolled squares, hex. and flats	3.58c.
Rivets	4.60c.
Boils and nuts, per cent off list	60 and 10

*Quantity extras per size apply. Quantity extras per thickness apply. Hot-rolled quantity extras are: 2000 lb. and over, base: 1500 lb. to 1999 lb., add 15c. per 100 lb.; 1000 lb. to 1499 lb., add 30c.; 0 to 999 lb., add 50c.
250 bundles and over, base. For 1 to 9 bundles add 50c. per 100 lb.; for 10 to 49 bundles add 25c.
Base for 1000 lb. and over. For 500 to 999 lb. add 25c. per 100 lb.; for 300 to 499 lb. add 75c.; for 0 to 299 lb. add \$1.25.

CHATTANOOGA

	Base per Lb.
Mild steel bars	3.31c.
Iron bars	3.31c.
Reinforcing bars	3.31c.
Structural shapes	3.56c.
Plates	3.56c.
Hot-rolled sheets, No. 10	3.36c.
Hot-rolled annealed sheets, No. 24	4.21c.
Galvanized sheets, No. 24	4.86c.
Steel bands	3.61c.
Cold-finished bars	3.98c.

MEMPHIS

	Base per Lb.
Mild steel bars	3.42c.
Shapes, bar size	3.42c.
Iron bars	3.42c.
Structural shapes	3.67c.
Plates	3.67c.
Hot-rolled sheets, No. 10	3.47c.
Hot-rolled annealed sheets, No. 24	4.27c.
Galvanized sheets, No. 24	4.97c.
Steel bands	3.72c.
Cold-drawn rounds	3.89c.
Cold-drawn flats, squares, hexagons	5.89c.
Structural rivets	4.25c.
Boils and nuts, per cent off list	65
Small rivets, per cent off list	50

NEW ORLEANS

	Base per Lb.
Mild steel bars	3.30c.
Reinforcing bars	3.50c.
Structural shapes	3.55c.
Plates	3.55c.
Hot-rolled sheets, No. 10	3.58c.
Hot-rolled annealed sheets, No. 24	4.50c.
Galvanized sheets, No. 24	4.95c.
Steel bands	3.95c.
Cold-finished steel bars	4.15c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	\$3.10
Boils and nuts, per cent off list	70

PACIFIC COAST

	Base per Lb.	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.55c.	3.60c.	3.55c.	3.55c.
Shapes, standard	3.55c.	3.60c.	3.55c.	3.55c.
Soft steel bars	3.60c.	3.60c.	3.60c.	3.60c.
Reinforcing bars, f.o.b. cars dock				
Pacific ports	2.45c.	2.45c.	2.45c.	
Hot-rolled annealed sheets (No. 24)	4.40c.	4.35c.	4.40c.	
Hot-rolled sheets (No. 10)	3.75c.	3.70c.	3.75c.	
Galv. sheets (No. 24)	5.00c.	4.95c.	5.00c.	
Cold finished steel:				
Rounds	5.95c.	5.85c.	6.00c.	
Squares and hexagons	7.20c.	7.10c.	7.25c.	
Flats	7.70c.	7.60c.	7.85c.	
Common wire nails—base per keg				
less carload	\$3.30	\$3.40	\$3.30	

All items subject to differentials for quantity.

TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

	Base per Lb.
High speed	87c.
High carbon chrome	87c.
Oil hardening	87c.
Extra	17c.
Regular	14c.

Open-Hearth Operations Higher at Cleveland



Finished Steel Demand Expands
Though Expected Automotive Orders
Are Still Lacking—Pig Iron Is Active

CLEVELAND, Sept. 10.—Open-hearth ingot output in the Cleveland-Lorain territory was increased nine points this week by the starting up of four additional furnaces in Lorain, where all 12 of the open-hearth furnaces are now operating. However, the Lorain plant took off its Bessemer converter, so that its steel production is only slightly heavier. The dismantling of the seven Newburgh furnaces of the American Steel & Wire Co. removes these open-hearth furnaces from listed capacity and brings open-hearth operations in this territory up 10 additional points, or to 64 per cent of capacity.

Miscellaneous demand for finished steel from widely diversified industries has expanded and the volume is quite satisfactory. New round-lot orders from automobile manufacturers for new models have not yet materialized. However, sheet makers look for considerable activity from the motor car field in the next two or three weeks, which will enable them to build up needed backlogs. Forging billets are quite active, orders from contract customers for September delivery at the old price being stimulated by the recent price advance. Merchant bars also have been stimulated by the price advance effective Oct. 1.

In the construction field, there is some improvement in inquiry for small lots of fabricated steel for private work, but there is an absence of new inquiry for public work. Railroads are buying small lots of structural steel for bridge repair work.

The Pere Marquette has placed 1700 tons of rails for laying in Canada and 450 tons of tie plates with a Canadian mill.

There is considerable activity in pig iron for the last quarter. Steel-making scrap is weaker in the absence of new buying by consumers.

Pig Iron

Sales have been in good volume since the opening of books for the fourth quarter a week ago. The

stimulus in activity has resulted from the possibility of a price advance before the end of the quarter. Many consumers who have been buying from hand to mouth or for a month's requirements have purchased all the iron they expect to need for the quarter but are not making speculative commitments. Purchases included considerable tonnage placed by automotive foundries. Shipping orders this month show a gain over the corresponding period in August.

Sheets

Mills are still awaiting the placing of round-lot orders by motor car manufacturers. Present demand from that source is limited to small lots. Jobbing stamping plants making automobile parts are ordering somewhat more freely than recently. Orders from manufacturers of steel drums are good, their business being stimulated by the seasonal demand for alcohol containers. Miscellaneous demand is quite satisfactory. Stove and washing

machine tub manufacturers continue to take fair-sized lots. The refrigerator industry is inactive. Mills are maintaining recent operations but are unable to accumulate backlogs.

Strip Steel

Not much new business is coming from the automotive industry, although some mills are receiving fair specifications from automobile parts plants. Demand for hot-rolled strip from cold rolling plants is only moderately active.

Bolts and Nuts

Increased production schedules are being put in effect by some makers because of the good volume of business on their books. While purchases by the automotive industry have been heavy, releases from that source are dragging. Fourth quarter prices are expected to be named this week. In view of the improved volume of business, makers hope to eliminate some of the irregularities that have prevailed for some time.

Bars, Plates and Shapes

Hot-rolled bars are in good demand from forge shops making motor car parts and from miscellaneous consumers. Orders for September delivery have increased from those consumers who will have to pay higher prices after Oct. 1 under the new price and extra schedules. In the construction field 500 tons of structural shapes for an administration building for the Easterly sewage disposal plant, Cleveland, have been



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Ni. **12%**

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awarded to the Fort Pitt Bridge Works Co. There was considerable activity in plain material during the week because of sizable releases by fabricators for construction jobs recently placed. Elyria has opened bids for a water main and tank requiring 1950 tons of plates. Inquiry for reinforcing bars is very light. Awards of two housing projects in Cleveland, requiring 2000 tons or more of reinforcing bars for which bids have been taken, have not yet been made.

Scrap

The market on steel-making scrap is slightly softer in the absence of any new consumer demand since the small purchase of heavy melting steel by a Cleveland mill at \$12.50, which was reported last week. While quotations are unchanged, brokers claim to be able to buy steel-making grades at around 25c. a ton lower than a week ago. Brokers are paying \$11.75 to \$12.25 for heavy melting steel for Cleveland delivery and \$13 to \$13.50 for Youngstown delivery. Blast furnace scrap is firm. Dealers are paying \$8 for blast furnace grades for Cleveland delivery and that price is not bringing out much scrap.

Philadelphia Plant Being Wrecked

THE Cleveland Wrecking Co. is liquidating and dismantling the entire Baeder-Adamson Paper Mills plant, Philadelphia. This company was manufacturer of sand paper and abrasives.

Consumer Buying Improves In Eastern Pennsylvania



Mill Operations Advance One Point to 39 Per Cent—Scrap Sells at Higher Levels

PHILADELPHIA, Sept. 10. — Even with railroads still refusing to buy, there is enough shipbuilding, automobile and miscellaneous tonnage coming into this market to keep district mills moderately busy. Operations in this area continue to lag behind the national rate, but this lag is to be expected as much of the capacity here is made up of plates and railroad supplies, two classes of material which have remained discouragingly inactive.

Mills report a noticeable pick-up in miscellaneous demand for full-finished and blue annealed sheets. Autobody fabricating plants are again in the market in a moderate way following the heavy purchases of the past few weeks. Metal furniture makers have recently bought a few carloads, stove makers continue to release steel to take care of seasonal demands, a radio maker has purchased against forward requirements, tank makers are busier, and small consumers are plac-

ing a greater volume of small lots with jobbers. These factors have all combined to inject a note of optimism in this area, and the consensus of the trade is that present schedules will be maintained and probably improved up to the turn of the year.

Bethlehem's operations are slightly better, Pencoyd and Coatesville continue to operate four and six furnaces respectively, Alan Wood is down to two furnaces, and Worth is now operating only one unit. These last two mills each intend to add an additional unit the first of October if present demands are maintained. Aggregate district operations are now one point higher than a week ago, being 39 per cent of potential capacity.

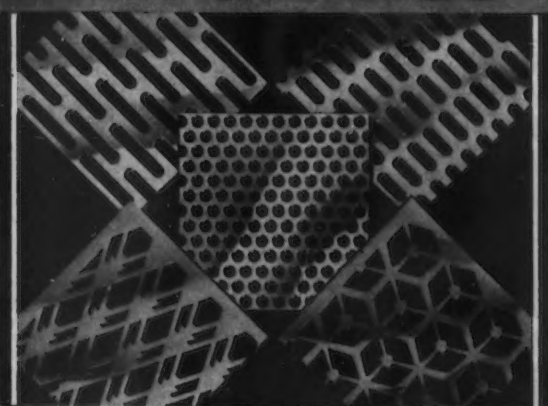
The major discordant note in the present market is the recently developed weakness in distributors' prices for both rail and billet reinforcing steel. Likewise the bolt and nut price schedules have descended to a discouragingly low level despite improved consumer demands. However, it is expected that some of these price weaknesses will be eliminated from the market over the next few weeks.

Jobbers are generally opposed to the new merchant wire and bar price and extra schedules. Very few purchases in this area average over several tons, and the quantity differential is consequently construed as imposing an unwarranted hardship. The new extras go into effect Oct. 1, but many jobbers continue to delay ordering for stock on the old basis in the hope that some other price set-up will be devised.

Pig Iron

Purchasing agents are more prone to consider stable prices as a certainty and are therefore more willing to order a greater distance into the future. Talk of possible price advances and a general improvement in foundry melt are also motivating factors leading to a more liberal buying policy. A fair volume of fourth quarter business has been placed during the past

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week, although no one consumer has ordered an exceptionally large amount.

Sheets and Strip

One radio maker is buying larger quantities of strip. Blue annealed sheets are in improved demand from tank makers, and miscellaneous purchases of full-finished sheets are considerably better. Also, sellers report a greater demand from furniture makers and stove plants. The local autobody stamping plants have entered some routine small orders but no large tonnages have been placed this week, inasmuch as commitments made during the previous two weeks will take care of October requirements. Some sheet sellers continue to insist that deliveries of competitors are overgraded in some instances, and also that the sheet market has been undercut on several large sales. Neither of these two accusations have been or, for that matter, can be verified.

Bars, Plates and Shapes

Sun Shipbuilding & Drydock Co. has placed practically all of the requirements of the Virginian ferryboat and the two Gulf Oil Co. tankers. The former tonnage went to one mill and the latter was divided between two large sellers.

Scrap

A sizable sale of No. 1 steel has been made at \$12.50, and one mill has purchased No. 2 steel at \$11.50. These higher mill prices were expected, as brokers have been paying \$12 freely for No. 1 to cover outstanding orders. An interesting development in this market is the attempt of one broker to secure No. 2 steel at Port Richmond for European delivery. Only \$10.50, delivered at dock, was offered; so it is apparent that very little material was attracted in that direction inasmuch as Pencoyd is paying \$11 to \$11.25. The freight from local yards is practically the same in both cases. This attempt to accumulate a cargo of steel here was influenced by the difficulty in securing sufficient material in either New England or the Southern States to cover existing contracts. There is no denying the fact that dealers are withholding accumulations and that scrap is generally less plentiful all along the seaboard. For this reason brokers are having difficulty at the present time in meeting mill delivery demands on existing contracts. Bethlehem is in the market for larger tonnages for Bethlehem delivery, and also continues to buy steadily at Baltimore for Sparrows Point.

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Further Rise in Steel Demand in South

BIRMINGHAM, Sept. 10.—Since Aug. 1 steel bookings have been moving upward at a steady rate and the present volume of new business is the best in a long while. The outlook for September and October is particularly favorable, as farm demand is growing and highway construction is being rushed. There is a daily stream of new orders for sheets and wire products, while plates, bars and struc-

tural shapes are being booked more frequently. For a few days last week, open-hearth operations were at 50 per cent, 12 of the 24 units in Alabama being in production. The Tennessee Coal, Iron & Railroad Co., which during the preceding week had seven out of nine at Fairfield in operation, added an extra unit for a few days, increasing the Fairfield total to eight out of nine. Gulf States Steel Co. continues with four out of six at Alabama City. The schedule this week calls for 11, seven at Fairfield and four at Alabama City.

Nashville Bridge Co. has booked

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100 tons of structural steel for the State Highway viaduct at Bessemer.

Pig iron demand is gradually moving forward but not at the rate of steel. Buying is still limited mostly to small lots and the market is largely on a spot basis. Daily orders and shipments are a little better this month than in August and the month will likely show an improvement. There is no change in furnace operations, six being in blast. Four of these are on foundry iron and two on basic.

The cast iron pipe market is slow and prospects for this month are not bright, but the local plants are looking forward to better business in October and November, expecting a sharp rise in PWA requirements.

Pig Iron Buyers Cover In Southern Ohio

CINCINNATI, Sept. 10.—Anticipatory contracting for pig iron for fourth quarter delivery has gathered momentum, furnace interests reporting commitments in excess of 20,000 tons. In addition to the forward purchases, district melters ordered about 800 tons for current needs. Fourth quarter purchasing in substantial amount reflects continued confidence in steady business improvement, since furnaces have not offered any inducements to stimulate forward buying. Of course, reports that at some

time during the fourth quarter advances in pig iron prices may become necessary because of increased production costs have been current, but these have been too nebulous to account for pig iron contracting. Jobbing foundry melt has improved, and automotive foundry operations are reported to be increasing. While melt by stove foundries is seasonably steady, machine tool foundries have eased operations pending the outcome of the national show this week.

Demand for finished sheets in this area has moved upward to about 75 per cent of capacity, following an increase in buying from automotive sources, which swelled the already steady demand from miscellaneous users. As a result of the increase in demand, which is expected to continue through the remainder of this quarter and into the next, district mills stepped up production schedules to 70 per cent, reducing backlogs to less than a week's full operation.

By-product foundry coke shipments have increased.

Refusal of district mills to purchase scrap at current levels has halted the bullish trend of prices and contributed a softer undertone to the district market. In fact, dealer offerings to mills on the basis of current quotations have been refused, consumers suggesting that trading can be done only at lower figures. Dealers, however, continue to be optimistic and look for increasing strength as automotive manufacturers get into operation.

Boston Export Scrap Market Strengthens

BOSTON, Sept. 10.—The export scrap market is firm, with buying holding up well. The lowest price paid for No. 1 steel the past week was \$9.25, and for No. 2 steel \$8.25 a ton, delivered dock, as against \$9 and \$8 a ton respectively in the preceding week. Against old contracts exporters are paying \$9.50 a ton, delivered dock, for No. 1 steel, and \$8.50 for No. 2. A boat sailed Sept. 5 with 2750 tons for Port Talbot, Wales, of which 900 tons was loaded at Portland, Me. A steamer with 6800 tons for Italy, scheduled to sail last week, will clear today.

Pig iron demand has improved moderately, both in number of sales and in tonnage. Sales for the week ranged from carlots to 100 ton lots or larger, the aggregate being around 1500 to 1800 tons. The Draper Corp., Hopedale, Mass., is inquiring for an unstated tonnage, but will probably purchase around 2000 to 3000 tons. Several thousand tons of Dutch iron is reported to have arrived at Providence, R. I., and a round tonnage of Indian iron arrived here the past week, the latter being sold before it arrived.

Buffalo Rate Advances

BUFFALO, Sept. 10.—After cutting open-hearth operations to six furnaces the latter part of last week, Bethlehem's Lackawanna plant on Saturday placed two additional units in operation and on Monday, one more, bringing its present active total up to nine. Republic Steel Corp. is operating four open-hearths and Wickwire-Spencer Steel Corp. one. For a day or so Wickwire-Spencer had two furnaces operating during the changeover. The Seneca sheet division of Bethlehem is operating at 60 per cent of capacity.

The addition of the silicosis hazard within the scope of New York State workmen's compensation insurance is adversely affecting pig iron business in this State. Producers report that some foundries have shut down altogether in view of the increase in compensation insurance rates, and others are having their castings made in Pennsylvania. Pig iron business has fallen off.

The week in the scrap market was dull, but there is no weakening of prices.

Rail Order Enlivens New York Market



New York Central Closes for 7400 Tons — Miscellaneous Steel Demand Continues to Expand

NEW YORK, Sept. 10.—The New York Central has closed for 7400 tons of rails, of which 2400 tons is optional, distributing the orders among the Carnegie, Bethlehem and Inland companies. Necessary track accessories were also purchased. The Cambria & Indiana Railroad, Philadelphia, has placed orders for the repair of 500 to 1000 hopper cars with the Avis, Pa., shops of the New York Central. The steel for the first 500 cars has been placed. The Magor Car Corp., New York, has closed for material required for 100 hopper cars bought by the Grand Trunk Western. With these exceptions railroad demand for steel in this district is almost negligible.

Tin plate demand is likewise light in keeping with the season, but steel demand from other sources is expanding. Most current orders are small but numerous, forming an impressive aggregate. Anticipatory buying occasioned by recent changes in extra cards has been confined mainly to galvanized sheets, on which the jobbers' discount of \$2 a ton is to be eliminated Oct. 1. The volume of business in standard pipe has improved somewhat of late, although the price situation in the resale market is still unsatisfactory.

Buyers' reaction to the new quantity deductions on bars has not been wholly favorable. The deductions are confined to orders of over 25 tons of one size and one analysis. It is pointed out that few buyers are in a position to place orders of a carload or over in a single size. The observation is also made that for most buyers the new set-up will mean an advance of \$1 a ton, the full extent of the advance in the base price.


It is now reported that deductions and extras similar to those adopted for hot-rolled bars will be applied to hot-rolled strip steel and to alloy steel bars.

Export trade, outside of scrap, has failed to manifest any stimulation as a result of the Italo-Ethiopian war scare. On the contrary, export prices have grown weaker rather than stronger. The foreign

pipe market is notably soft, reflecting the failure of the French and German members of the tube cartel to patch up their quota quarrel.

Pig Iron

Several furnace representatives are talking of possible advances in prices as the result of increased production costs. Although no price revision is expected in the near future, the attitude is serving to force in increased tonnages. Total fourth quarter bookings of all district sellers amounted to 4200 tons last week, of which about one-third will be shipped out of this immediate consuming area. This figure compares with 1750 tons sold in the previous week and 1250 tons sold in the period a fortnight ago. A number of foundries have lately released against con-



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tracts considerably ahead of schedule thereby validating the report that nearby jobbing plants are experiencing a pick-up in miscellaneous casting orders. An additional brand of iron will be marketed in this area when the Colonial Iron Co. blows in its Riddlesburg, Pa., furnace about Oct. 15. When this stack was operating a number of years ago, a good portion of the output was sold along the seaboard. The domestic coke business is now threatened with serious German competition. Many Brooklyn foundries have commenced using imported coke which can be delivered to their yards at about \$9 a ton. This coke is reported as being on a par in quality with what domestic ovens can offer.

Reinforcing Steel

Distributors are considerably encouraged by the heavier list of pending projects. Awards during the week totaled only 225 tons for a bridge at Newark, N. J., and a bridge in Henry Hudson parkway in New Jersey. New York State will open bids during the month on projects requiring well over 2000 tons of bars and mesh, a building in Tarrytown, N. Y., will require 350 tons, and bids on the Staten Island Rapid Transit Co. bridges will be opened Sept. 20. These latter bridges will require 750 tons of bars.

Scrap

The bulk of the output of this area continues to go to export. Current prices are attracting suffi-

cient tonnages of heavy melting steels to make up several cargoes for Japan each month on old contracts. Likewise, occasional cargoes are going to Italy. Deliveries to England continue quite heavy, Norway has taken some blast furnace grades, and scrap rails have recently been delivered to Egypt. Therefore, it is apparent that after a temporary let down, exports again have an upward trend. Only a revived demand from Japan for new tonnages is needed to further strengthen this market. Eastern Pennsylvania mills continue to draw steel from nearby New Jersey points. Although \$9 and \$8 a ton for No. 1 and No. 2 steels respectively, are obtainable in Jersey, the top broker prices for these grades in the immediate New York area are \$8.75 and \$7.75 a ton respectively.

Stove Plants Lift Operations at St. Louis

ST. LOUIS, Sept. 10. — August shipments of pig iron to melters in the St. Louis territory are said to have been the heaviest in the last five years, and one maker reports that the last month was the best of the year. With indications of advancing prices, a heavy movement also is expected in September. Beginning Sept. 15, operations in the stove foundries in the Belleville district will be stepped up a day to six days a week because of heavy order files. Some plants,

behind two weeks on their orders, are running two shifts.

Although the demand for heavy melting steel is light, the edge having been taken off because of weakness in Chicago, foundry grades are stronger in demand and prices are higher. Steel angle bars are \$1 higher, and machinery cast, railroad malleable and No. 1 railroad cast are 50c. up. Country dealers are offering scrap more freely than they have been to the larger dealers here, who are buying only enough to cover current orders.

August bookings by warehouses are estimated to have been about 10 per cent ahead of July and 25 per cent ahead of August a year ago, while the first ten days of September indicate another good month. Boiler tubes are the most active item at this time.

Mills have been receiving small orders in only fair volume. Mississippi Valley Structural Co. has been awarded 120 tons for a Dallas airplane hangar, 150 tons for a Missouri Pacific bridge and 220 tons for a machine building at Alton.

New Bids to Be Taken On Coast Conduit Job

SAN FRANCISCO, Sept. 9. — With awards signed, sealed and delivered on the Metropolitan Water District's huge reinforcing steel tonnage, activity on the Pacific Coast has resumed a more normal pace. Bids for the 2000 or 3000 tons of conduit were rejected and new bids will be opened Sept. 25 by the district. Until a decision is made on the type of conduit to be accepted, an award of the 5500 or 5750 tons of structural steel for the transmission towers must be held in abeyance. Pacific Coast Steel Corp'n. is low bidder.

Among the limited lettings during the past week an award to Minneapolis-Moline Power Implement Co. of 370 tons of shapes for a high school at Anaheim, Cal., was outstanding. At San Francisco the Truscon Steel Co. took 380 tons of reinforcing bars for the administration building and plaza on the Trans-Bay bridge. Western Pipe & Steel Co. booked 175 tons of plates for ventilating pipes for the Los Angeles Department of Water and Power.

New projects listed are mostly in the Los Angeles territory. Bids are to be taken Oct. 9 for constructing barracks, mess halls and quarters at Pearl Harbor, T. H., at an estimated cost of \$490,000. It is believed that bids for the floating drydocks, at the same place, will be opened within the next 30 days.

Stocks of Spelter Reduced 3300 Tons During August as Shipments Rise

Copper Buying at Low Level As Reports of Price Advances Are Discounted
—Tin Quiet and Weaker—Lead Dull

NEW YORK, Sept. 10.—The copper market was without development last week, having been quiet but steady. The month's domestic sales through Sept. 7 totaled 4047 tons. Although there is discussion of a possible increase in prices, no definite information in support of this contention is available, and indications are that the present price level of 8.50c. a lb., Connecticut Valley, will be continued in the immediate future. The foreign market also is featureless with prices holding at about 8.20c. a lb., usual Continental base ports. Copper fabricators are watching with interest for prospects of heavy buying by the utilities now

that the Wheeler-Rayburn bill has become a law. During the recent session of Congress they were almost entirely out of the market, but now that they have some assurance of the future it is likely that their normal replacement programs will at least be resumed.

Tin

The market is characterized by unusual lack of demand, and prices have consequently declined further. Straits tin could be bought here today at 48.25c. a lb. as against 48.62½c. a week ago. At London this morning, standard metal was quotable at £218 5s. for spot and £208 for futures, while in the East

offerings were at £216 5s. Bookings by tin plate producers have been practically at a standstill with only an occasional carlot being sold. Little, if any, support has been forthcoming from the automobile industry where last week production fell to extremely low levels. Tin buyers have been holding off in view of the pending meeting of the International Tin Committee tomorrow in Brussels.

Lead

Demand this week is at a slightly better rate than was the case immediately after Labor Day. Some sellers have now contracted for practically all of their September output and consumers are showing more interest in October lead. Prices are firm at 4.20c. a lb., St. Louis, and 4.35c., New York, while the leading interest is still asking a \$1 a ton premium on sales in the East. Secondary producers are following a particularly cautious policy in selling as scrap offerings are light and they do not wish their commitments to rise above their assured intake. As a result, primary producers have taken business usually going to secondary interests in some instances. The ore market is unchanged at \$45 a ton.

Zinc

Publication of August statistics, reflecting a decline of 3300 tons in stocks during the month had little effect on the market, although the sharp increase in shipments was certainly a bullish factor. The month's shipments of 39,200 tons compared with only 32,241 tons moved in July, while production rose to 35,922 tons from 35,055 tons in the preceding month. A drop of 1759 tons in undelivered sales occurred last week and bookings held for future delivery now amount to 34,700 tons. Sales during the week were even lighter than in the preceding period, only 2324 tons having been placed, as compared with 2800 tons in the week before. The market generally is inactive, though current price levels are well supported. According to the Prime Western Zinc Producers Committee, total Prime Western sales for August delivery equaled 5980 tons at a weighted average price of 4.522c. a lb., East St. Louis. Sales during August for subsequent delivery amounted to 16,012 tons at a weighted average price of 4.491c. Prices on Prime Western are currently unchanged at 4.60c. a lb., East St. Louis, and 4.97½c., New York. Considerable activity developed in the ore market on the week-end, with sales of 11,900 tons reported on Saturday. Ore prices are unchanged at \$29 and \$30 a ton respectively for the flotation and mill grades.

The Week's Prices. Cents Per Pound for Early Delivery

	Sept. 5	Sept. 6	Sept. 7	Sept. 9	Sept. 10
Electrolytic copper, N. Y.*	8.25	8.25	8.25	8.25	8.25
Lake copper, N. Y.	8.62½	8.62½	8.62½	8.62½	8.62½
Straits tin, spot, New York	48.70	48.50	48.50	48.40	48.25
Zinc, East St. Louis	4.60	4.60	4.60	4.60	4.60
Zinc, New York†	4.97½	4.97½	4.97½	4.97½	4.97½
Lead, St. Louis	4.20	4.20	4.20	4.20	4.20
Lead, New York	4.35	4.35	4.35	4.35	4.35

*Refinery quotations; price ¼c. higher delivered in Connecticut.

†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19c. to 21c. a lb., delivered.
Aluminum, No. 12 remelt, No. 2 standard, in carloads, 16.25c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb., base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 13c. a lb., New York.
Quicksilver, \$69 to \$71 per flask.
Brass ingots, commercial 85-5-5-5, 8.50c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig.	49.75c. to 50.75c.
Tin, bar.	51.75c. to 52.75c.
Copper, Lake	9.50c. to 10.50c.
Copper, electrolytic	9.50c. to 10.50c.
Copper, castings	9.25c. to 10.25c.
*Copper sheets, hot-rolled	15.50c.
*High brass sheets	14.00c.
*Seamless brass tubes	15.75c.
*Seamless copper tubes	15.75c.
*Brass rods	12.50c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig.	4.85c. to 5.85c.
Lead, bar	5.85c. to 6.85c.
Lead, sheets	8.00c.
Antimony, Asiatic	13.50c. to 14.50c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ⅓	30.00c. to 31.00c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig.	53.50c.
Tin, bar	55.50c.

Copper, Lake	9.50c.
Copper, electrolytic	9.50c.
Copper, castings	9.25c.
Zinc, slabs	6.00c. to 8.25c.
Lead, American pig.	4.95c. to 5.30c.
Lead, bar	8.25c.
Antimony, Asiatic	15.50c.
Babbitt metal, medium grade	19.25c.
Babbitt metal, high grade	57.50c.
Solder, ½ and ⅓	31.50c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	6.00c.	6.75c.
Copper, hvy. and wire	5.87½c.	6.37½c.
Copper, light and bottoms	4.87½c.	5.37½c.
Brass, heavy	3.25c.	3.87½c.
Brass, light	2.50c.	3.25c.
Hvy. machine composition	5.37½c.	5.87½c.
No. 1 yel. brass turnings	4.50c.	5.00c.
No. 1 red brass or compos. turnings	4.87½c.	5.37½c.
Lead, heavy	3.25c.	3.62½c.
Zinc	2.37½c.	2.75c.
Cast aluminum	11.62½c.	12.75c.
Sheet aluminum	12.75c.	14.25c.

PAINT *Over* RUST

With this
**NEW
TRUSCON**
PRODUCT

Sounds like poor advice, doesn't it? Yet, almost every steel paint job is a paint-over-rust job. No amount of scraping or wire brushing can clean all the rust off the surface. And the rust that remains, even the specks, is enough to force off any good paint. Rust under a paint film produces more rust, and ruins both the surface and the paint.

Bar-Ox "Formula 97" was produced in our laboratories to stop the development of rust under a paint film. Even if you can't clean off all the rust (only the loose particles)—be sure to saturate with Bar-Ox "Formula 97"—then paint. Some industries where they formerly had to repaint each month, have made a painting last a whole year where the steel was first treated with Bar-Ox "Formula 97."

Ask for Truscon Bulletin No. 403, entitled, "Paint Over Rust."

THE TRUSCON LABORATORIES

Box 69-C, Milwaukee Jet. P.O., Detroit, Mich.

Finished Steel Demand is Maintained in Valleys

YOUNGSTOWN, Sept. 9.—Demand for finished steel in the Valleys lost some of its snap during the holiday week. Volume of bookings since Sept. 1, however, is holding at the August rate. While operating schedules over Labor Day were somewhat erratic, raw steel output gained momentum toward the close of last week and is beginning the current period at a fairly steady pace. Addition of one or two open-hearth furnaces planned at one unit may be offset by minor curtailment at other plants, and average output probably will hold at 60 per cent. All of the Valley's Bessemer capacity is engaged.

Miscellaneous consuming lines continue to outrun demand from the automotive industry, railroad and constructional fields, but it may be significant that a good deal of the so-called unclassified tonnage is traceable indirectly to activity in motor car centers. Sheet and strip orders for automobile manufacture are gaining, but the current movement of those grades of steel for new models is considered to be only in the earliest stages. Galvanized roofing is in heavy demand, largely from jobbers who are stocking in anticipation of the new extras to become applicable on Oct. 1.

Anticipatory buying has not yet gotten under way in instances

where the new set-up on hot-rolled carbon bars will increase prices for small quantities, but producers here believe such business may expand noticeably before the close of the month. On the other hand, many small buyers have become accustomed to hand-to-mouth buying schedules that were the general rule under the code and may not depart from spot buying methods so readily as in pre-code days. The substantial savings afforded large buyers of hot-rolled carbon bars are expected to bring a partial return to backlog tonnage, which was rather elusive during the life of the code, when all buyers were on an equal basis. Application of the new size extras on hot-rolled bars, announced early in August, will become general on Oct. 1.

Wire production in this district is running close to 65 per cent. A substantial flow of orders for manufacturers' wire is the major sustaining influence. Anticipatory covering by those buyers adversely affected by the new price schedules to become effective for fourth quarter is making noticeable headway. Wire nails are in good demand.

The proposed natural gas line from the terminal of the Panhandle Eastern Pipe Line Co. in Indiana to Detroit is assuming more specific character, but the line still is far from being a certainty. The project, which is planned for com-

pletion by next summer, would require about 60,000 tons of line pipe, provided a thin-wall 24-in. diameter pipe be used. Other small line pipe projects are being figured, but tonnage requirements are not important. Consignments of standard pipe are moving steadily in moderate volume, while oil country goods provide the bulk of the current movement. Pipe mills here are operating at about 30 per cent. Seamless pipe mill schedules are running as high as 65 per cent, but the average is pulled down by the slow pace of lapweld and butt-weld operations.

The Republic Steel Corp.'s tin plate mills at Warren are maintaining a 50 per cent rate, but in view of seasonal shrinkage in demand a drop in output within a few weeks is considered to be inevitable.

Scrap prices here are strong. No. 1 heavy melting steel is holding at \$14, delivered.

Pipe Lines

Continental Oil Co., Ponca City, Okla., plans new welded steel pipe line from oil properties in northern part of Acadia Parish, La., to water terminal, about 11 miles, for crude oil transmission to latter point, where barge shipments will be made to Port Arthur, Tex.

Compania Nacional de Gas, S. A., Piedras Negras, Mexico, plans welded steel pipe line from Eagle Pass, Tex., for natural gas supply at Piedras Negras, where concession has been secured for commercial gas service. Steel pipe lines will be built at latter place for distribution. Connection will be made at Eagle Pass with existing steel pipe line extending to natural gas fields, about 20 miles.

United States Engineer Office, Jacksonville, Fla., asks bids until Sept. 16 for seven 24-in. hammerweld steel plate discharge pipes, 1/2-in. thick, with cast steel flange welded on each end of each pipe; two similar pipes, same size and thickness, with cast steel flanges each end, as noted; and one similar pipe, same size and thickness, with one cast steel flange welded on one end and one loose flange fitted to other end (Circular 93).

Pennsylvania Railroad Co., 15 North Thirty-second Street, Philadelphia, closes bids Sept. 17 for steel pipe and boiler tubes (Contract 12-1935).

Taft, Tex., plans steel pipe lines for natural gas distribution in city limits. Cost close to \$40,000. J. E. Ward, Harvey-Snyder Building, Wichita Falls, Tex., is consulting engineer.

Detroit plans welded steel pipe line for belt system for furnishing natural gas for industrial service in different parts of city, in connection with proposed municipal ownership project covering gas utilities. Fund of about \$3,000,000 will be arranged through grant and loan by PWA.

Colony Oil & Gas Co., Lloydminster, Sask., plans welded steel pipe lines for gas supply. Cost over \$75,000.

Western Pipe & Steel Co. has tendered low bid to Los Angeles Water and Power Bureau for 20,000 ft. of 18-in. welded steel ventilating pipe, No. 14 U. S. gage.

White Eagle Division of Socony-Vacuum Oil Co., in association with Empire Oil & Refining Co., Texas Co., and Phillips Petroleum Co., will build a 100 mile 8-in. pipe line from Burtron into New Rice and Russell areas of western Kansas.

Boulder City, Kan., has awarded 500 tons of steel pipe for power plant to Grinnell Co. of Pacific and Associated Piping & Engineering Co.

Western Pipe & Steel Co. is low bidder on 100 tons of steel pipe for United States Engineers, Los Angeles.

LATE RETURNS

(CONTINUED FROM PAGE 29)

for pickling prior to galvanizing. Duriron steam heating coils in this acid stand up for periods averaging six months. However, it has been a problem to secure bolts for holding these coil sections together that will stand up for more than six weeks. Copper, bronze, alumite, monel, brass and even hard rubber have been tried, with brass standing up the longest.

Bolts $\frac{1}{2}$ by $\frac{3}{4}$ in. in size made of a new I. J. D. alloy, made by I. J. D. Metal Products Co., South Milwaukee, Wis., were then tried and a service record well over six months resulted. Recently an entire heating coil was cast of this I. J. D. metal, and a life of at least one year is expected.

This alloy has a base of copper with about 3 to 4 per cent of aluminum. Other ingredients are held secret pending allowance of patent claims. A metallurgist of one steel plant has conducted corrosion tests in a 5 per cent sulphuric acid solution at 20 deg. C. Average loss in weight was 0.0035 gm. each 24 hr. In a 5 per cent sulphuric acid at 60 deg. C., the loss averaged 0.0088 gm. each 24 hr., and for a 5 per cent hydrochloric acid solution at 20 deg. C. the loss averaged 0.0093 gm. for 24 hr. The resistance in muriatic acid is about the same as for sulphuric.

One Milwaukee company making valves and fittings of this material is now running corrosion tests in paper mills throughout Wisconsin.

Fibrous-Textured Steel Crystals

A NEW interpretation of "radial asterism" was presented last October to the American Society for Metals by Norman P. Goss of the Cold Metal Process Co. According to this concept, a grain or crystal, heretofore considered a single crystal, is in reality built up of smaller crystal units. The "building blocks" comprising this crystal are large, and the blocks are even further subdivided into smaller units. In other words, there is a structure within a structure.

In 1928, Mr. Goss found certain crystals of Armco iron which had X-ray diffraction patterns not char-

acteristic of a true single crystal. That is, instead of obtaining a pattern like Fig. 2 (left), which is that of a true single crystal of Fe_2O_3 , a pattern like that shown at the right in Fig. 2 was obtained.

This latter pattern resembles the familiar fiber diagrams of cold-rolled metals. Mr. Goss now ascribes the innermost diffraction spots as being reflections from [110] planes. In this particular grain, the [100] axis of the various unit building blocks tended to be perpendicular to the surface, but due to the imperfections in crystallinity the [100] axis of the various building blocks deviate several degrees of angle from the ideal position. The component parts of the various diffraction maxima are diffused instead of sharply defined. Mr. Goss states that this indicates further subdivision of the larger blocks into smaller units, which only deviate a few seconds of angle from the orientation of the parent block.

The appearance of "radial asterism" on X-ray diffraction patterns has always been interpreted as indicating the existence of strain. Mr. Goss and his associate, Professor Nusbbaum, however, have shown that it is due to block movement of lattice fragments or slip lines during heat treatment and is, there-

fore, related to recrystallization phenomena.

Strip Steel in Stripes and Patterns

ACME STEEL CO. is now marketing Satinstrip, which is steel strip having stripes or patterns rolled into the steel by specially ground rolls. This strip is available in many different kinds of stripes, varying in width and depth. Even with applications of chrome, nickel or color finishes, the beauty of the design is not impaired in any way. It is expected that this product will find a particular application as a "modern" decorative motif, where a practical construction medium is required in combination with a smartly attractive finish. A reproduction of several of these finishes is shown in Fig. 3.

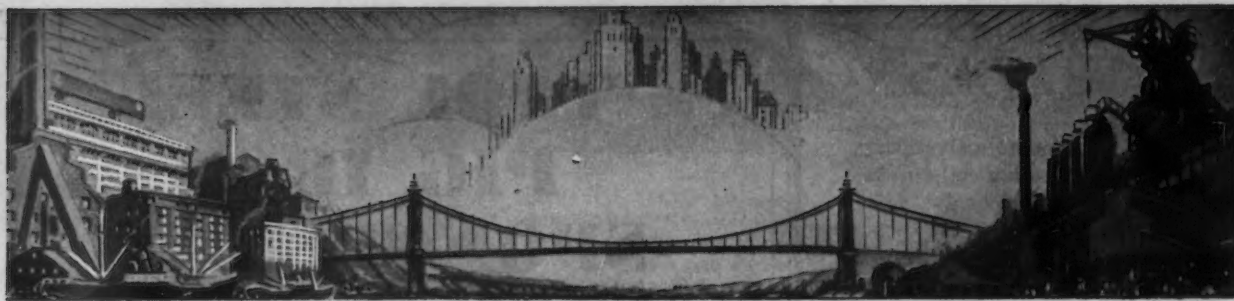
Steel Construction Institute to Meet

THE American Institute of Steel Construction, Inc., will hold its thirteenth annual convention at the Greenbrier Hotel, White Sulphur Springs, W. Va., Oct. 16 to 18. V. Gilmore Iden, 200 Madison Avenue, New York, is secretary.

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Ball-Bearing Wire, Welding Wires,
High and Low Carbon Specialties

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Plant Expansion and Equipment Buying

Heavy Machine Tool Buying Expected Immediately After Show

WHILE business last week was extremely quiet, sellers expected little business prior to the show and are concentrating sales effort in Cleveland this week. Of particular interest is the fact that automobile makers are turning their attention to tool room buying for the first time in five years. Orders of this type are ex-

pected to bulk large as soon as the show is concluded.

Opening of bids on the tools required for the naval aircraft factory at Philadelphia has been postponed until Sept. 17. Chevrolet is still buying tools for Saginaw and Ford is in the market constantly. Other large lists are being postponed until later in the month.

◀ NORTH ATLANTIC ▶

Board of Village Trustees, Rockville Centre, L. I., asks bids until Sept. 25 for one 2500-kva. a.c. oil engine type electric generator, with accessories, one 2900-hp. Diesel engine with auxiliary equipment, 40-kw. direct-connected exciter and miscellaneous equipment for municipal electric light and power plant.

North American Aviation, Inc., 1776 Broadway, New York, manufacturer of airplanes and parts, has taken out permit for main one-story unit, 300 x 300 ft., for new plant on 20-acre tract lately acquired at Mines Field, Los Angeles. Other units will be built. Cost about \$500,000 with machinery. L. B. Norman, 1034 Seventeenth Street, Santa Monica, Cal., is architect; E. R. Doak, 1066 Stearns Drive, Los Angeles, is local factory manager; L. G. Jost is company engineer. Company is a subsidiary of General Motors Corp.

Board of Education, Lynbrook, N. Y., plans manual training department in new three-story high school. Cost about \$500,000 with equipment. Financing is being arranged through Federal aid. Tooker & Marsh, 101 Park Avenue, New York, are architects.

Socony-Vacuum Oil Co., Inc., 26 Broadway, New York, has let general contract to Arthur G. McKee & Co., Cleveland, for new bulk oil storage and distributing plant at McKees Rocks, Pa. Cost about \$70,000 with steel tanks, pumping machinery and other equipment.

Board of Education, Troy, N. Y., plans manual training department in new three-story high school, for which bids will be asked soon on general contract. Cost about \$500,000. William E. Clark, Cannon Building, is architect.

Anaconda Copper Mining Co., 25 Broadway, New York, is carrying out modernization and expansion program at copper smelting plant, Tootle, Utah, operated in name of International Smelting Co., to include additional equipment.

Pharma Chemical Co., 169 West Fifty-second Street, Bayonne, N. J., manufacturer of industrial and other chemicals, has purchased one-story factory at 178-94 West Fifty-third Street, on site 100 x 187 ft., for expansion.

Frank Nechworth, Newark, N. J., has leased one-story building at 252-54 North Tenth Street, totaling about 5000 sq. ft. floor space, for new automobile body works, including parts and repair department.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 17 for one motor-driven screw machine turret lathe (Schedule 5950), three paint spray cabinets (Schedule 5805) for Philadelphia Navy Yard; one dehumidifying unit complete, including motor-driven air compressor, cooling coil unit, valves and other equipment (Schedule 5902) for Philadelphia or New York yard.

Naval Aircraft Factory, Navy Yard, Philadelphia, is securing appropriation of \$440,000 for new arresting gear platform unit with mechanical equipment and complete accessories. Construction Quartermaster will be in charge. Plans are also under way for extensions and improvements in Mustin Flying Field at yard, including hangars, shop and repair facilities, and other structures, for which a fund of \$800,000 has been authorized.

United States Engineer Office, Philadelphia, asks bids until Sept. 18 for eight oil-fired sectional header watertube cross-drum machine-type boilers, complete with oil burners and accessories.

◀ NEW ENGLAND ▶

Bridgeport Brass Co., Housatonic Avenue, Bridgeport, Conn., manufacturer of brass and bronze rods, sheets, tubing, etc., will soon take bids for one-story addition. Cost over \$45,000 with equipment. Fletcher-Thompson, Inc., 1336 Fairfield Avenue, is architect and engineer.

Franklin Automobile Co., Syracuse, N. Y., has acquired Doman-Marks Engine Co., Amesbury, Mass., manufacturer of air-cooled industrial and motor truck engines and parts, and will remove works to Syracuse, where production will be carried out in future. Acquired company is headed by E. S. Marks and Carl T. Doman, formerly chief engineer and research engineer respectively of H. H. Franklin Mfg. Co., predecessor of purchasing company, who will become connected with Franklin organization.

Board of Selectmen, West Boylston, Mass., plans manual training department in new two-story high school. Cost close to \$175,000. Financing will be arranged through Federal aid. Frost, Chamberlain & Edwards, 390 Main Street, Worcester, Mass., are architects.

Malden Crushed Stone Co., Newburyport Turnpike, Saugus, Mass., plans rebuilding part of storage, distributing and loading plant recently destroyed by fire. Loss about \$50,000 with elevating, loading and other mechanical equipment.

Town Council, Brandon, Vt., plans new municipal electric light and power plant. Cost about \$150,000 with equipment. Financing will be arranged through Federal aid. Raymond Palmer, 7 Montgomery Avenue, Holyoke, Mass., is consulting engineer.

◀ SOUTH ATLANTIC ▶

City Council, Savannah, Ga., plans extensions and improvements in municipal airport, including new hangar, 120 x 120 ft., with two one-story adjoining buildings, each 30 x 30 ft., for machine shops, reconditioning and repairs. Entire project will cost about \$175,000. Financing is being arranged through Federal aid. A. S. Goebel is city engineer.

Savannah Electric & Power Co., Savannah, Ga., plans extensions and improvements in steam-operated electric generating station, including new turbo-generator unit and auxiliary equipment. Cost about \$360,000. Financing is being arranged.

City Council, Greenwood, S. C., plans installation of elevated steel tank and tower for municipal water system. Cost about \$26,000. Financing is being arranged through Federal aid. Wiedeman & Singleton, Atlanta, Ga., are consulting engineers.

Planters Distilling Co., Inc., Charleston, S. C., care of P. Lester Hawks, Mount

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TO COMPENSATE FOR
WEAR AND LOOSENESS



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Live Action!

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Washer does for a product!
All because it has *Live Action!*
A live, continuously working
part functioning as a spring
. . . . with sufficient range of action
to retard wear and looseness.

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SPRAGUE HOIST DIVISION
SHEPARD NILES CRANE & HOIST CORPORATION
116 South Schuyler Avenue, Montour Falls, N. Y.

Airy, N. C., president, recently organized, plans new plant in West Shore Terminal district on Ashley River, Charleston, where site has been selected. It is scheduled for completion before close of year. Cost over \$75,000 with equipment. Robert L. Jessup, Crystal, W. Va., is secretary of new company.

◀ SOUTHWEST ▶

Meyer Kornblum Packing Co., 300 Central Avenue, Kansas City, Kan., meat packer, will soon take bids on general contract for two-story and basement addition. Cost over \$50,000 with equipment. Menges-Mange, Inc., 1515 North Grand Avenue, St. Louis, is architect and engineer.

Arkansas Light & Power Co., Little Rock, Ark., plans new transmission and distributing lines in Clark and Hempstead counties, Nev., for rural electrification, including power substation and service facilities. Present transmission line will be extended from Bierne to Arcadia, Boughton and vicinity. Cost over \$150,000.

Wagner Electric Corp., 6400 Plymouth Street, St. Louis, has let general contract to Hercules Construction Co., 7807 Forsythe Boulevard, Clayton, St. Louis, for remodeling former warehouse on Locust Street, to be converted for two-story and basement service and repair unit.

Board of Education, Library Building, Kansas City, Mo., plans manual training department in new three-story and basement high school at Meyer Boulevard and Indiana Avenue, for which bids will soon be asked on general contract. Cost about \$750,000. Wight & Wight, First National Bank Building, are architects; Nate W. Downes, Finance Building, is mechanical engineer.

Common Council, Stanberry, Mo., plans new municipal electric light and power

plant, using Diesel engine-generators, including electrical distribution system. Cost about \$100,000. Financing is being arranged through Federal aid. Henrick-Lowry Engineering Co., 114 West Tenth Street, Kansas City, Mo., is consulting engineer.

International Harvester Co., Chicago, has let general contract to A. E. Rheiner & Co., Exchange Building, San Antonio, Tex., for one-story factory branch, service and repair building, with parts department and other divisions, 89 x 285 ft., for motor truck division, at San Antonio. Cost close to \$100,000 with equipment. J. M. Ryan is company manager at San Antonio.

◀ WASHINGTON DIST. ▶

Commanding Officer, Aberdeen Proving Grounds, Aberdeen, Md., asks bids until Sept. 20 for one standard rotation marine engine and one opposite rotation marine engine (Circular 22).

Board of District Commissioners, District Building, Washington, asks bids until Sept. 18 for gas generators, electric heaters, motors, ammeters, balances, batteries, galvanometers and other precision tools and equipment.

Board of Supervisors of Henrico County, Court House, Twenty-second and Main Streets, Richmond, Va., asks bids until Sept. 22 for water supply system at Highland Springs, Va., including 200,000-gal. elevated steel tank on 100-ft. steel tower, two deep-well turbine pumping units, capacity 150 gal. per min., pipe lines, control equipment, fittings, etc. R. Stuart Royer, Builders' Exchange Building, Richmond, is consulting engineer.

General Purchasing Officer, Panama Canal, Washington, asks bids until Sept. 17 for one motor-driven grinding machine, 24 warehouse barrel trucks, 36,000 ft. steel wire rope, copper cable, magnet wire,

twist drills, pipe dies, files, hand shovels, cross-cut saws, clay picks, mortising chisels, scythe blades, 94 sledge hammers, 480 rods wire fencing, 50 chilled cast iron wheels for towing locomotives, 24 cast steel locomotive tender wheels and other equipment (Schedule 3087).

Virginia Airship Co., Richmond, Va., Garrett W. Peck, president, is acquiring tract adjoining Byrd Airport, totaling over 850 acres, as site for new plant for manufacture of airplanes and parts, also airport terminal building. Financing for \$175,000 has been arranged through Federal aid.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 17 for two tractors for Annapolis, Md., and Kansas City, Mo., respectively (Schedule 5938); malleable and cast iron pipe fittings (Schedule 5877); until Sept. 20, faucets, cocks and valves (Schedule 5921) for Eastern and Western navy yards; two main generator engine lubricating oil pumps, control appliances and spare parts (Schedule 5946), 12 marker buoy cables (Schedule 5925) for Portsmouth and Mare Island yards.

◀ BUFFALO DISTRICT ▶

Monarch Tank & Metal Fabricating Corp., Lackawanna, N. Y., recently organized, has taken over plant of company of similar name on Ingham Avenue, for production of heavy steel tanks and other fabricated steel specialties. New organization will be affiliated with Kaustine Co., Inc., Perry, N. Y., manufacturer of light steel fabricated products, and both works will be under same management. John B. Mollnow, general manager of last noted company, will be president of Monarch company; Kendall P. Smith and A. Donald Sloane, both officials of Kaustine company, will be vice-president and secretary respectively of Monarch organization.

Board of Works, Binghamton, N. Y., plans new one-story municipal shop. Fund of \$24,000 has been secured through Federal aid for building.

Willis-Morrow Co., Elmira, N. Y., manufacturer of automobile equipment, bankrupt, will offer plant and property at public sale, under direction of receivers, on or about Oct. 1, at price not less than \$300,000. Recent offer of Elmira Industrial Corp., Elmira, of \$250,000 has been rejected by Federal Court.

Gauthier Foundry Co., Inc., Buffalo, has been organized by Theodore A. Viehe, 72 Main Street, Hamburg, N. Y., and associates, to manufacture metal castings.

◀ WESTERN PA. DIST. ▶

James Clark Distilling Corp., 20 Exchange Place, Jersey City, N. J., has purchased plant of Bridgewater Distilling Co., West Bridgewater, Pa., for new distillery. Plant has present capacity of about 12,000 bbl. per year which will be increased with additional equipment and facilities.

Jewell Ridge Coal Co., Bluefield, W. Va., plans new coal tippie at mining properties on Knox Creek, near Jewell Ridge district. Cost over \$40,000 with equipment.

City Council, Oil City, Pa., plans expansion and improvements in municipal memorial airport, including new hangars, with repair and reconditioning facilities, oil storage and distributing units, lighting system, etc. Cost about \$45,000 with equipment. B. B. Weber is city engineer.

◀ OHIO AND INDIANA ▶

Home City Brewing Co., Springfield, Ohio, has plans for extensions and improvements, to include brew-house equipment, tanks, kettles, boilers and accessories, motor-driven pumping machinery and other equipment. Cost close to \$70,000 with equipment. Konrad Keil, 1215 Windsor Drive, Dayton, Ohio, is consulting engineer.

Elwell-Parker Electric Co., 4205 St. Clair Avenue, Cleveland, manufacturer of factory trucks and parts, lift trucks, etc., has let general contract to John Gill & Son, Bulkley Building, for new two-story plant unit, 120x160 ft., on Hamilton Avenue,



300 YARDS OR



3000 MILES



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Blaw-Knox & Western Pipe Corporation
Caine Steel Co.
Carnegie Steel Co.
Chicago Forging & Mfg. Co.
Colorado Fuel & Iron Co.
Columbia Steel Co.
Continental Roll & Steel Foundry Co.
Corlett, J. F., & Co.
Crucible Steel Co. of America
Cyclone Fence Co.
Dayton Malleable Iron Co.
Eastern Rolling Mill Co.
Edgecomb Steel Corporation
Finkl, A., & Sons Co.
Fitzsimons Co.
Flagg, Stanley G., & Co.
Fort Pitt Tool & Supply Co.
Frasse, Peter A., & Co.
General American Tank Car Corporation
Gulf States Steel Co.
Halcomb Steel Co.
Hazard Wire Rope Co.
Hensel, E. R., Steel & Copper Co.
Hickman, Williams & Co.
Higgins, Dean & Co.

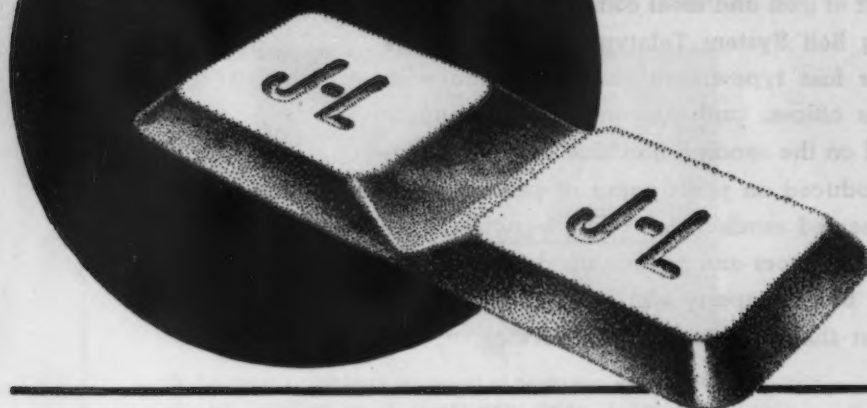
64

IRON AND STEEL COMPANIES

use Bell System
Teletypewriter
Exchange
Service

Holliday, W. J., & Co.
Hyman, Michaels Co.
Illinois Steel Co.
Inland Steel Co.
Jones & Laughlin Steel Corp.
Joseph, Robert
Latrobe Elect. Steel Co.
Lavino, E. J., & Co.
Lewis, Chas. C., Co.
Ludlum Steel Co.
Lukens Steel Co.
Metal Specialty Co.
Milne, A., & Co.
National Tube Co.
Newman-Crosby Steel Corp.
Otis Steel Co.
Pacific Coast Steel Corp.
Pittsburgh Tube Co.
Reading Iron Co.
Republic Steel Corp.
Ryerson, Jos. T., & Son, Inc.
Sharon Steel Hoop Co.
Singer Iron & Steel Co.
Spang, Chalfant & Co.
Steel and Tubes, Inc.
Superior Steel Corp.
Taylor Forge & Pipe Works
Tennessee Coal, Iron & Railroad Co.
Truscon Steel Co.
Tyler, W. S., Co.
Weirton Steel Co.
Western Metal Mfg. Co.
Western Pipe & Steel Co.
Youngstown Sheet & Tube Co.

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and malleable trade . . . no scrap

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AMERICAN IRON AND STEEL WORKS
PITTSBURGH, PENNSYLVANIA

**J & L
STEEL**

N. E., where company has large tract. Cost close to \$125,000 with machinery. George S. Rider Co., Marshall Building, is architect and engineer.

City Council, Dover, Ohio, asks bids until Sept. 19 for extensions and improvements in municipal electric light and power plant, to include new high-pressure boilers and accessories, steam turbine unit, condensers, stokers, switchgear and other equipment. Cost about \$330,000 with equipment. Waldo Harline is city engineer.

Cleveland Hobbing Machine Co., 1170 East 152nd Street, Cleveland, has let general contract to Peck & Udell Construction Co., 2341 Carnegie Avenue, for two-story extension, 30x40 ft., and one-story top addition, 30x80 ft. Cost over \$60,000 with equipment.

Contracting Officer, Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Sept. 17 for pitot tube housing supports, pitot tube housings, pitot tube housing sockets, pitot tube wing cover angles, pitot tube wing spar plates, air speed pitot tube housing assemblies, and air speed pitot tube housing supports (Circular 175), 15,000 cowl safety pins (Circular 164); until Sept. 18, bonding clamps (Circular 166), 3600 storage battery vent plug assemblies (Circular 169); until Sept. 27, 200 tank assemblies (Circular 165).

Studebaker Corp., South Bend, Ind., plans new branch assembling works at Los Angeles, to include main production unit with auxiliary structures for parts, storage and distribution, etc. Cost over \$175,000 with equipment.

Board of Public Works, City Hall, Fort Wayne, Ind., C. F. Hess, secretary, plans extensions and improvements in municipal electric light and power plant, including new boiler unit with accessories, control equipment, etc. Cost over \$35,000. P. F. Thiele is engineer.

◀ SOUTH CENTRAL ▶

Louisiana Oil Corp., Shreveport, La., plans new bulk oil storage and distributing plant at Corinth, Miss., including service, repair and garage unit for company motor trucks, battery of five steel tanks, pumping station and other structures. Cost over \$60,000 with equipment.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until Sept. 19 for one outdoor metal-clad, multiple circuit switchgear unit for Wheeler hydroelectric power plant.

Armour Fertilizer Works, Atlanta, Ga., affiliated with Armour & Co., Chicago, has acquired plant of Redd Chemical & Nitrate Co., Birmingham, for new branch factory. Additional equipment will be installed.

Lake Tool Co., Longview, Tex., manufacturer of oil well tools, tanks and other plate products, plans new branch plant at Jennings, La., comprising five one-story shop units. Cost over \$45,000 with equipment.

City Council, Meridian, Miss., plans new municipal electric light and power plant, and electrical distribution system. Cost over \$150,000. Financing will be arranged through Federal aid.

◀ MIDDLE WEST ▶

American Spring & Wire Specialty Co., 816 North Spaulding Avenue, Chicago, has let general contract to F. Markewicz, 5000 George Street, for one-story addition, 112x122 ft. Cost over \$60,000 with equipment. Grotz-Wasgelein Co., 3825 North Cicero Avenue, is architect.

Central Pattern & Foundry Co., 3737 South Sacramento Avenue, Chicago, has let general contract to Joseph Komorowski, 10221 South Carpenter Street, for one-story foundry addition, 69x110 ft. Cost

close to \$40,000 with equipment. Anton A. Tocha, 1459 Dickson Street, is architect.

Wheatridge School District No. 3, Wheatridge, Colo., plans manual training department in new two-story high school. Cost about \$125,000. Bond issue has been approved. J. K. Monroe, Twenty-second Street and Broadway, Denver, is architect.

St. Cloud Brewing Co., Eighth Avenue North and Sixth Street, St. Cloud, Minn., plans one-story addition, 70x70 ft. Cost about \$35,000 with equipment. L. C. Pinault, Granite Exchange Building, is architect.

Board of Education, North Platte, Neb., plans manual training department in new three-story and basement junior high school. Fund of \$225,000 is being arranged through Federal aid. C. C. Coursey, Neville Building, is architect.

Chevrolet Motor Co., 3044 West Grand Boulevard, Detroit, will soon begin superstructure for new one and two-story factory branch, service, storage and distributing building, 140x315 ft., at Des Moines, Iowa, for which general contract recently was let to Arthur H. Neumann & Brothers, Hubbell Building, Des Moines. Cost about \$150,000 with equipment. Albert Kahn, Detroit, is architect.

Board of Education, Moorhead, Minn., plans manual training department in new three-story junior high school, for which bids will be asked soon on general contract. Cost \$272,000. Financing is being arranged through Federal aid. Ellerbe & Co., Minnesota Building, St. Paul, Minn., are architects; Carter & Meinecke, Moorhead, are associate architects.

Griffith Laboratories, 1415 West Thirty-seventh Street, Chicago, manufacturer of packers' equipment and supplies, has let general contract to Person Construction Co., 130 North Wells Street, for one-story addition, 57x123 ft., for storage and distribution. Cost about \$30,000 with equipment. A. Epstein, 2001 West Pershing Road, is architect and engineer.

Marathon Chemical Co., Rothschild, Wis., has placed general contract with Paramount Construction Co., 735 North Water Street, Milwaukee, for new chemical laboratory and manufacturing plant, 60x200 ft., one to three stories, costing about \$100,000 with equipment. Grover Keeth is company engineer.

Trustees of Merrillan, Wis., are about to ask bids for rebuilding dam and erecting new hydroelectric generating station on Wisconsin River at cost of about \$75,000. Walter S. Woods, 304 Main Street, La Crosse, Wis., is consulting engineer. C. A. Anderson is village clerk.

Hunsinger Construction Co., 1827 North Thirtieth Street, Milwaukee, is successful bidder for general contract on \$300,000 plant extension and modernization program at Milwaukee factory group of Pittsburgh Plate Glass Co., 235 East Pittsburgh Avenue.

◀ MICHIGAN DISTRICT ▶

National Broach & Machine Co., 11457 Shoemaker Street, Detroit, has let general contract to W. E. Wood Co., 4649 Humboldt Street, for one-story addition. Cost close to \$30,000 with equipment.

Chrysler Corp., 341 Massachusetts Avenue, Detroit, has asked bids on general contract for one-story addition to plant at Windsor, Ont., operated in name of Chrysler Corp. of Canada, Ltd., 100x240 ft. Cost about \$550,000 with equipment. Hutton & Souter, Piggott Building, Hamilton, Ont., are architects.

City Commission, Flint, Mich., has plans for new municipal electric light and power plant, including electrical distributing lines. Cost about \$2,000,000. Financing is being arranged through Federal aid. Black & Veatch, 4706 Broadway, Kansas City, Mo., are consulting engineers.

L. A. Young Spring & Wire Corp., 9200 Russell Street, Detroit, will establish a branch plant at Chicago, to give employment to over 350 men. Property has been acquired and it is expected to have unit ready for service before end of October. Company recently established new branch works at Toronto, Ont., for manufacture of bed springs and allied specialties.

Interstate Tool Co., 19636 Mitchell Street,



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DETROIT, MICH.

**TEST THIS
WELDIT GASAVER
FREE FOR TWO WEEKS
IN YOUR PLANT**

Detroit, has plans for one-story addition. Cost about \$25,000 with equipment. George W. Graves, 233 John R Street, is architect.

Cast Iron Pipe

Everett, Mass., has closed bids on 255 tons of 6, 8 and 10-in. Warren Foundry & Pipe Corp'n. is low bidder.

Concord, N. H., closes bids Sept. 12 for 320 ft. of 6-in., 720 ft. of 8-in. and 6740 ft. of 12-in. cement-lined pipe.

Chelsea, Mass., has awarded a tonnage of 6 and 10-in. pipe to United States Pipe & Foundry Co.

Chicago has awarded 1595 tons to Glamorgan Pipe & Foundry Co.

United States Pipe & Foundry Co. is low bidder on 100 12-ft. lengths of 20-in. and 200 12-ft. lengths of 24-in. for Chicago.

Kaukauna Wis., closed bids Sept. 6 on 5000 ft. of 6-in. centrifugal pipe.

Little Chute, Wis., closed bids Sept. 6 on 3700 ft. of 6-in.

Williams Bay, Wis., has let general contract for 25,884 ft. of 4 to 8-in. water main extensions to E. M. Schellow, Elgin, Ill.

Montgomery, Ala., plans about 98,000 ft., various sizes, for water supply. Fund of \$362,400 is being arranged through Federal aid for this and other waterworks installation, including new 1,000,000-gal. reservoir.

Roxboro, N. C., plans 4800 ft. of 6 and 8-in. for water supply. Financing is being arranged through Federal aid, including fund of about \$19,000 for new pumping station and equipment.

Marlow, Okla., plans pipe lines for water supply. Fund of \$29,000 is being arranged through Federal aid for this and other waterworks installation. V. V. Long & Co., Colcord Building, Oklahoma City, Okla., are consulting engineers.

Danville, Ohio, plans water pipe lines. Fund of \$43,000 is being arranged through Federal aid for this and other waterworks installation. M. D. Shaffer, Richland Trust

Building, Mansfield, Ohio, is consulting engineer.

Sudbury, Mass., has plans for pipe lines for water system and other waterworks construction. Fund of \$100,000 has been arranged. Fay, Spofford & Thorndike, 44 School Street, Boston, are consulting engineers.

Marshall, Va., plans pipe lines for water supply. Fund of \$30,000 is being arranged for this and other waterworks installation.

Nelson, Neb., plans pipe lines for water system. Fund of \$85,000 is being secured through Federal aid for this and other waterworks construction.

Strasburg, Va., has voted bonds for \$43,000 for pipe lines for water supply, new filtration plant and other waterworks installation.

Charleston, S. C., plans about 16,400 ft. of 16-in. for main water line; also 3000 ft. of 8-in. for new loop line, and replacement of 12,000 ft. 20-in. wooden stave pipe line in Meeting Street with new cast iron mains. Cost about \$210,000. Financing is being arranged through Federal aid. J. E. Gibson, 14 George Street, is engineer.

Combined Locks, Wis., plans pipe lines for water system. Fund of \$15,700 being arranged through Federal aid. A. E. McMahon Engineering Co., Menasha, Wis., is consulting engineer.

Iola, Kan., plans new trunk line for water service between pumping station and standpipe, with smaller connecting lines. Fund of \$40,500 is being secured through Federal aid. Paulette & Wilson, Farmers Union Building, Salina, Kan., are consulting engineers.

Board of County Supervisors, Staunton, Va., has authorized pipe lines for water system at Craigsville, Va., and will arrange financing through Federal aid. Cost about \$55,000 with other waterworks construction.

Los Angeles, plans financing in amount of \$6,989,300 through Federal aid, for extensions and improvements in municipal water distribution system, including pipe lines for new territory and replacements, and other waterworks equipment.

Fresno, Cal., will take bids Sept. 19 on 300 tons of 4 to 10-in.

Tools Keep Pace with Machine Tool Progress

(CONTINUED FROM PAGE 19)

plating and refinishing. Chromium-plated gages give from five to 10 times the service of unplated gages regardless of type of steel used. Fig. 24 shows an Electrolimit gage grading cylinder bores and Fig. 25 shows a gage of the same type in use grading pistons. When assembled, just the right clearance will be provided and no expensive hand-fitting is required.

Fig. 26 shows the grading of the wristpin hole in a connecting rod; wristpins are also graded on similar equipment. The internal gage provides a three-point check of which two bearing surfaces are cemented carbide strips and the third a diamond.

It is safe to predict that the immediate future holds many advances for the gage field. Semi-automatic and full-automatic gaging devices will be developed. Such parts as automotive wristpins and ball and roller bearings are promising fields for such development. Already, the thickness of strip steel and tin plate is being checked automatically as the material is rolled in the mills. Strip steel passes through an Electrolimit gage at speeds up to and even exceeding 1000 ft. per min., with thickness variations immediately indicated in terms of ten-thousandths of an inch. It is said that the gage enables the operator to produce strip within a tolerance of 0.0002 in. at speeds up to four times the highest possible speed at which the strip could be produced without the use of such a gage.

The thousands of visitors to the 1935 Machine Tool Show and Congress will have an opportunity of noting epoch making advances not only in machine tools, but equally in cutting tools and gages. Complementary advance in all of these machine shop "tools" will no doubt provide the metalworking industry as the years go by with even greater product-improving and cost-reducing facilities.

Scrap Unchanged At Detroit

DETROIT, Sept. 10.—The local scrap market has a quieter tone, although prices remain fairly firm and unchanged.

JUST BETWEEN US TWO

Reader Interest at 212°

PEOPLE are all excited about that editorial, "Are You Interested in Potatoes? You Should Be"—page 9, Aug. 29 Iron Age. Letters swamped us. The mails were not fast enough for some. They telephoned or wired.

We had to make reprints. If you want two or three, the address is 239 W. 39th St., N.Y.C.

Gertrude Stein-ish

IN the hope that it is complimentary, we quote this from a New York State subscriber's letter:

"I can't resist the interest of this journal. It is worth two in the bush."

Oberleutnant Gets the Old One-Two

AMBIGUITY gives way to crystal clarity in this orchid from a Barcelona, Spain, reader:

"The Iron Age is for me the best technical paper I get from the U. S."

He Asks Us Riddles

SOMEBODY in Milford, Conn., who got one of our subscription envelopes made us pay 4¢ postage on a tract asking, "Where will You spend eternity?" To help us comprehend eternity, the tract asks us a question that will certainly curdle the intellect of even the brightest of the fifteen "Just-Between-Us-Two-ers":

"Suppose a bird were given the task of moving every grain of sand from this earth to the sun—93 million miles—one grain at a time—1,000 years per round trip. Think how long it would require to move one acre, 4,000 miles deep."

There, Mr. Pig and Hog Feed Man, is something to chew your pencil over. Remember that as the acre approaches the center of the earth the area lessens. Remember, too, you might strike rock, or water, or erl. Also allow for fissures. And where are you when you have the answer? No place, for the tract says, "When the task is completed, eternity will have only begun." So it seems a waste of time and we are sorry we mentioned it in the first place.

Eye-Catcher

PEOPLE told us they thought Warner & Swasey's front cover on the Aug. 29 issue was one of the most striking we have had this year.

Impatient Jews' Harpers

A BOOM is raging in jews' harps, according to *Industrial Britain*. Birmingham, England, factories can't keep up with demand. The head of one Birmingham firm just returned from the United States with an order for 160,000 of what are humorously termed "these musical instruments."

The British publication says insultingly that jews' harp bands are popular in the United States.

Birmingham is the only place in the world where jews' harps are made. It seems there is some trick about tongue-setting. Will American industry accept this challenge lying down? We hope so, for next to bagpipes the jews' harp is the world's most maddening instrument, and there is no telling what harm an advertising campaign could do.

Intuitive Judgment

THE shower of orchids that regularly greets Iron Age editorials contains an occasional skunk cabbage, and sometimes the cabbage has a little note pinned to it, reading:

"As we don't agree with your editorial policy. Cancel our subscription."

Remember the story of the country judge who announced after hearing the prosecution, "The case is closed. My mind is made up. I don't want to hear any more as it would only confuse me."

Can anyone flatter himself that he holds an intelligent opinion on any subject if he closes his mind to evidence on either side?

Accurate Author

THE central character in James Boyd's best seller, "Roll River," a story with an industrial milieu beginning in the '80s, is reported as "looking up from his copy of The Iron Age . . ."

Thanks, Mr.—as we say in Brooklyn—Berd, for the ad.

—A.H.D.

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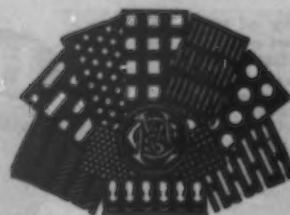
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Genuine 18% Tungsten High Speed Steel cutting edge. Unbreakable alloy steel body (patented weld). Strength and set for deep drilling. Save time, labor, material; step up capacity of light presses.

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Write for Circular



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Bulletin on new Insert Chaser Type of Die Head.
Bulletin on H & G Threading Machines.

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21-41 Barclay Street, New Haven, Conn.

Los Angeles: A. C. Behringer, 312-316 Commercial St., Los Angeles, Cal.
San Francisco: A. H. Crites Company, 1142 Howard St., San Francisco, Cal.



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"The Tool Holder People"
309 N. Francisco Ave., Chicago, U.S.A.

Products Index

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ABRASIVE CLOTH & PAPER
Norton Co., Worcester, Mass.

ABRASIVES—Steel Shot and Grit
American Foundry Equipment Co., Milwaukee, Ind.
Pangborn Corporation, Hagerstown, Md.

ACCUMULATORS—Hydraulic
Baldwin-Southwark Corp., Southwark Div., Philadelphia.
Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
Wood, R. D., & Co., Philadelphia.

ACETYLENE—Dissolved in Cylinders
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Prods. Co., The, 30 East 42nd St., N. Y. C.

ACID RECOVERY EQUIPMENT
Chemical Construction Corp., 30 Rockefeller Plaza, New York City.

ACIDS—Pickling
American Chemical Paint Co., Ambler, Pa.

AIR TANKS AND CYLINDERS
Seale, William B., & Sons Co., Pith.

ALLOYS—Calcium-Silicon
Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

ALLOYS—Copper
Mallory, P. B., & Co., Inc., Indianapolis, Ind.

ALLOYS—Magnesium
Dow Chemical Co., 921 Jefferson Ave., Midland, Mich.

ALLOYS—Phosphor Bronze
Phosphor Bronze Smelting Co., The, Phila. Riverside (N. J.) Metal Co.
Ryerson, Jos. T., & Son, Inc., Chicago.

ALLOYS—Silico-Manganese
Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

ALLOYS—Titanium
Metal & Thermite Corp., 120 B'way, N. Y. C.

Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

ALLOYS—Tungsten
Vanadium Corp. of America, 120 Broadway, N. Y. C.

ALLOYS—Vanadium
Vanadium Corp. of America, 120 Broadway, N. Y. C.

ALLOYS—Zinc Base Die Casting
New Jersey Zinc Co., The, 160 Front St., N. Y. C.

ALUMINUM
Aluminum Co. of America, Pittsburgh.
Seligman, Arthur, & Co., Inc., 30 Rockefeller Plaza, B. C. A. Bldg., N. Y. C.

AMMETERS AND VOLTMETERS—Recording
Bristol Co., The, Waterbury, Conn.

AMMONIA RECOVERY PLANTS
Koppers Construction Co., The, Pittsburgh.

ANGLES, BEAMS, CHANNELS AND TEES
Carnegie Steel Co., Pittsburgh.
Illinois Steel Co., Chicago.
Inland Steel Co., Chicago.
Jones & Laughlin Steel Corp., Pittsburgh.
Pacific Coast Steel Corp., San Francisco, Calif.
Ryerson, Jos. T., & Son, Inc., Chicago.
Steel & Tubes, Inc., Cleveland.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Weirton (W. Va.) Steel Co.

ANGLES, BEAMS, CHANNELS & TEES—Magnesium Alloys
Dow Chemical Co., 921 Jefferson Ave., Midland, Mich.

ANNEALING—See Heat Treating

ANNEALING BOXES
United Engineering & Pdry. Co., Pith.

ANODES—All Types
Feymour (Conn.) Mfg. Co.

ANODES—Cadmium
Idylite Co., The, Detroit.

ANODES—Cadmium
Idylite Co., The, Detroit.

ARBORS
Morse Twist Drill & Mch. Co., New Bedford, Mass.

ARMORING MACHINERY—Cable, Wire, Hoop
Sleeper & Hartley, Inc., Worcester, Mass.

ARRESTERS—Spark
Harrington & King Perforating Co., Chi.

AXLES—Car or Locomotive
Carnegie Steel Co., Pittsburgh.
Illinois Steel Co., Chicago.

BALANCING EQUIPMENT
Gisholt Mch. Co., Madison, Wis.

Sunstrand Mch. Tool Co., Rockford, Ill.

BALING PRESSES—Scrap—See Presses

BALLS—Burnishing
Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.
Hartford (Conn.) Steel Ball Co., The.
Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.
Fafnir Bearing Co., New Britain, Conn.
Hartford (Conn.) Steel Ball Co., The.
New Departure Mfg. Co., Bristol, Conn.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.

BANDS—Steel
Acme Steel Co., Chicago.
Bethlehem (Pa.) Steel Company.
Inland Steel Co., Chicago.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

BANDS—Welded
Amer. Welding & Mfg. Co., Warren, O.

BARREL COATING & RENOVATING MACHINES
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.

BARRELS—Burnishing
Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.

BARRELS—Tumbling
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Baird Mch. Co., The, Bridgeport, Conn.
Hartford (Conn.) Steel Ball Co., The.

BARS—Alloy
Republic Steel Corp., Youngstown, Ohio.

BARS—Aluminum
Aluminum Co. of America, Pittsburgh.

BARS—Brass, Bronze or Copper
Bunting Brass & Bronze Co., Toledo, Ohio.
Ryerson, Jos. T., & Son, Inc., Chicago.

BARS—Cold Drawn
Union Drawn Steel Co., Massillon, Ohio.

BARS—Concrete, Reinforcing
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Timken Steel & Tube Co., The, Canton, O.

Weirton (W. Va.) Steel Co.

Youngstown (Ohio) Sheet & Tube Co., The.

BASES—Column, Machinery
Lukens Steel Co., Coatesville, Pa.

BATTERIES—Storage
Electric Storage Battery Co., The, Phila.
Gould Storage Battery Corp., Depew, N. Y.

BATTERY CHARGERS
Cutler-Hammer, Inc., Milwaukee.

BEAMS—See Angles, Beams, Channels and Tees

BEARINGS—Ball
Bantam Ball Bearing Co., The, South Bend, Indiana.
Fafnir Bearing Co., New Britain, Conn.
Federal Bearings Co., Inc., Foughkeepsie, N. Y.
New Departure Mfg. Co., Bristol, Conn.
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Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Ball Tapered
Bantam Ball Bearing Co., The, South Bend, Indiana.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Rolling Mill Equipment
Bantam Ball Bearing Co., The, South Bend, Indiana.

SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.

Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Shaft Hanger
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., Newark, N. J.

Norma-Hoffmann Bearings Corp., Stamford, Conn.

SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.

BEARINGS—Thrust
Bantam Ball Bearing Co., The, South Bend, Indiana.